THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams: LANCET, WESTRAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. XI. OF VOL. I., 1932. LONDON, SATURDAY, MARCH 12, 1932 Pp. 120—Price 1s.
No. 5663. Vol. CCXXII. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

BY LIEUT.-COL. ROBERT HENRY ELLIOT, M.D., B.S. Lond., F.R.C.S. Eng., I.M.S., retd.

A TREATISE ON GLAUCOMA
2nd Edition, Revised and Enlarged. 30s. net.

TROPICAL OPHTHALMOLOGY.
With 7 Plates and 117 Illustrations. 31s. 6d. net.
Spanish and French Editions, 1922. Full German Abstract.

THE CARE OF EYE CASES: 12s. 6d. net.
A MANUAL FOR NURSES, PRACTITIONERS, AND STUDENTS
Chinese Edition. Oxford University Press.

GLAUCOMA 4s. net.
A HANDBOOK FOR THE GENERAL PRACTITIONER.

THE INDIAN OPERATION OF COUCHING FOR CATARACT.
7s. 6d. net. H. K. Lewis and Co. Ltd.

THE TONSILS AND ADENOIDS
AND THEIR DISEASES: INCLUDING THE PART THEY PLAY IN SYSTEMIC DISEASES.
By IRWIN MOORE, M.B., C.M.
Demy 8vo. 395 pp. 107 Illustrations. Price 21s. net.
"On any question regarding tonsils and adenoids, this exhaustive work by Dr. Irwin Moore must be regarded as the final authority for many a long day to come."—PRACTITIONER.
"Provides an admirable guide, reliable and up to date, on the subject dealt with."—MEDICAL TIMES.
"Should be in the library of the medical student, general practitioner and the consultant."—MEDICAL WORLD.
Wm. Heinemann (Medical Books), Ltd., 99, Great Russell-street, London, W.C.1.

DISEASES OF THE THYROID GLAND.
WITH SPECIAL REFERENCE TO THYROTOXICOSIS.
By CECIL A. JOLL, M.S., B.Sc.(Lond.), F.R.C.S.(Eng.).
This book deals comprehensively with the structure, function, and pathology of the thyroid gland. The medical and radiological methods of treatment both in simple and in toxic goitre are fully described, in addition to operative technique.
Crown 4to. Fully Illustrated. £3 3s. net.
Wm. Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

FRACTURES.
By MEURICE SINCLAIR, C.M.G., M.B., CH.B. (EDIN.)
With an Introduction by Sir ROBERT JONES, Bt., F.R.C.S.
Pp. 550. 337 X-Ray photographs, photographs and diagrams. 24s. net.
Constable & Co., Ltd., London.

THIRD EDITION. With many Illustrations. 12s. 6d. net.
TREATMENT OF DISEASES OF THE SKIN.
By KNOWSLEY SIBLEY, M.A., M.D., B.Ch.(Camb.).
London: Edward Arnold & Co., 41 and 43, Maddox Street, W.1.

OESOPHAGEAL OBSTRUCTION:
ITS PATHOLOGY, DIAGNOSIS AND TREATMENT
(including four chapters on Cancer of the Œsophagus).
By A. LAWRENCE ABEL, M.S. Lond., F.R.C.S. Eng., Assistant Surgeon to the Cancer Hospital, &c.
Pp. 245. 132 Illustrations. 2 Col. Plates. 30s. net.
"Masterful and complete . . . Cannot be too highly praised."
—SURG. GYN. AND OBSTET. JOUR.
Oxford University Press, Amen House, London, E.C.4.

With 25 Illustrations. Demy 8vo. 9s. net; postage 5d.
STERILITY IN WOMEN:
DIAGNOSIS AND TREATMENT.
By SIDNEY FORSDIKE, M.D., B.S. (Lond.), F.R.C.S., Surgeon to the Hospital for Women Soho Square, London, &c.
"Will well repay the most careful study."—THE LANCET.
London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C.1

245 pages, with numerous Illustrations. Price 12s. 6d. Postage 9d. Abroad 1s. 2d.
The technique, the merits, and the demerits of every birth control method now generally advocated or practised.
PHYSICIANS' MANUAL OF BIRTH CONTROL.
By ANTOINETTE F. KOMIKOW, M.D.
¶ "*This volume will amply repay the physician who will carefully consider the contents no matter what attitude he takes on the subject of Birth Control.*"—MEDICAL REVIEW OF REVIEWS.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2

JUST PUBLISHED. 24s.
TEXTBOOK OF GYNÆCOLOGY.
By SIDNEY FORSDIKE, M.D., B.S., F.R.C.S.
Demy 8vo. Fully Illustrated. 16s. net.
This book, written for students and practitioners, includes the recent advances in gynæcology, while retaining work which remains of a laboratory nature.
Wm. Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

FIFTH EDITION. Pp. v+251. With Coloured Plate and 92 other Illustrations. Price 8s. 6d. Postage 6d.
REFRACTION OF THE EYE.
By ERNEST CLARKE, C.V.O., M.D., F.R.C.S.
The simplest book on Refraction, especially written for the General Practitioner.
"Can be recommended to the student as the very best on its subject."—BRITISH MEDICAL JOURNAL.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

NOW READY. Price 2s. net; postage 1d.
DISEASES OF THE HEART
IN RELATION TO ANÆSTHETICS FOR DENTAL OPERATIONS.
By BELLAMY GARDNER, M.R.C.S., L.R.C.P. Lond., Late Anæsthetist and Instructor in Anæsthetics at Charing Cross Hospital and the Royal Dental Hospital of London; Honorary Anæsthetist to the King George Hospital, the Royal Orthopædic and the Male Lock Hospitals.
John Bale Sons & Danielsson, Ltd., 83/91, Great Titchfield Street, London, W.1.

NOW READY. Pp. viii+60 with 4 plates. Price 7/6; postage 4d.
RESEARCH WORK ON
THE PNEUMOCOCCI & THEIR ENZYMES
AND ITS SIGNIFICANCE IN LOBAR PNEUMONIA.
BY A. COWAN GUTHRIE, M.B. (EDIN.)
¶ "Dr. Guthrie's investigations .... yield important indication for treatment."—MEDICAL PRESS AND CIRCULAR.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

With 16 plates. Demy 8vo. 9s. net. Postage 5d.
PYELOGRAPHY:
ITS HISTORY, TECHNIQUE, USES AND DANGERS.
By ALEX. E. ROCHE, M.A., M.D., M.Ch., F.R.C.S.
With an Introduction by SIR JOHN THOMSON-WALKER, F.R.C.S.
"... will be of great use .... an up-to-date treatise."—B. M. JNL.
London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C.1.

Kaplan's
Radiation Therapy

"*Gives a general outline of what can be accomplished by X rays, radium, and endothermy . . . The cases are well described and profusely illustrated, and within the limits of the book the details given are reliable. The book undoubtedly provides an excellent bird's-eye view of the whole subject.*"—BRITISH MEDICAL JOURNAL.

By IRA I. KAPLAN, M.D., Director, Division of Cancer, Department of Hospitals, New York City. With a special chapter on *Applied X Ray Physics*, by CARL B. BRAESTRUP, B.Sc., P.E., Radiation Physicist, Division of Cancer, Department of Hospitals, New York City. Octavo of 354 pages, with 227 illustrations. Cloth, 30s. net.

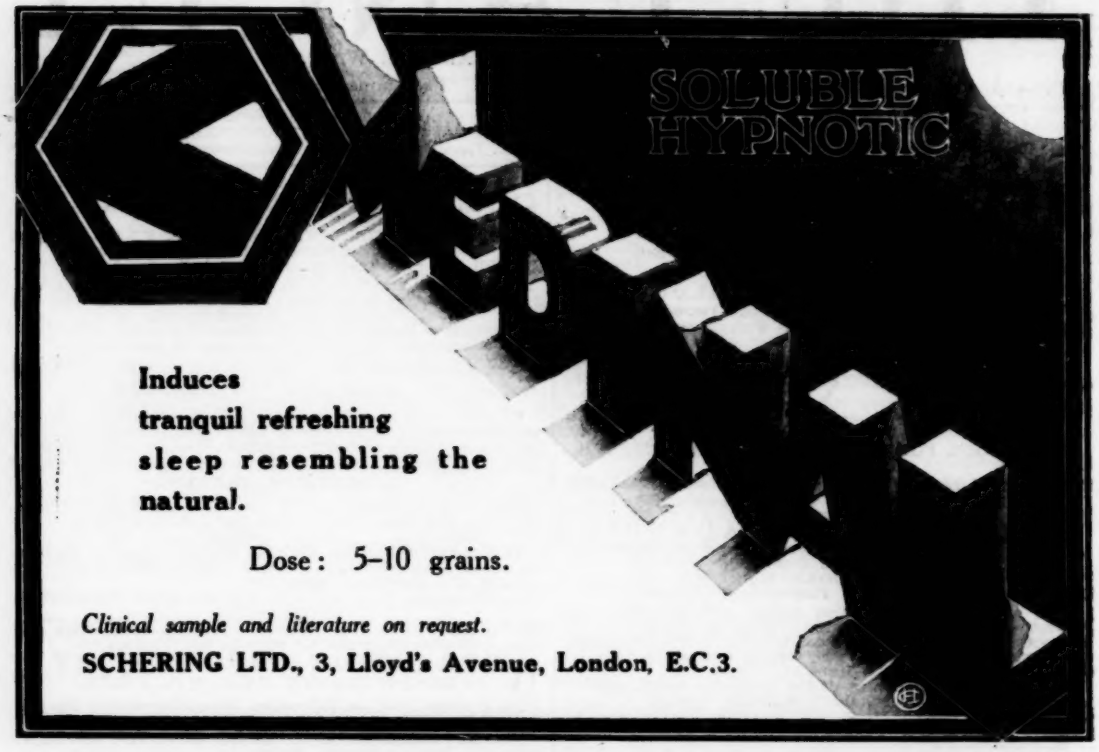
Moorhead's
Traumatotherapy

"*A valuable book for anyone who sees many accident cases .... A useful and interesting chapter is that on the medico-legal aspect of accidents, and there is a wealth of valuable information in it . . . The illustrations must be specially mentioned. Many are line drawings which for truth and artistic merit deserve great praise.*"
—EDINBURGH MEDICAL JOURNAL.

By JOHN J. MOORHEAD, B.Sc., M.D., F.A.C.S.(D.S.M.), Professor of Surgery and Director, Department of Traumatic Surgery, New York Post-graduate Medical School and Hospital. Octavo of 574 pages, with 602 illustrations. Cloth 35s. net.

SAUNDERS' NEW ILLUSTRATED CATALOGUE SENT POST FREE ON REQUEST.

W. B. SAUNDERS COMPANY LTD. . . 9, Henrietta Street . . LONDON, W.C.2.



Induces tranquil refreshing sleep resembling the natural.

Dose: 5–10 grains.

Clinical sample and literature on request.

SCHERING LTD., 3, Lloyd's Avenue, London, E.C.3.

Valentine's Meat-Juice

For **Quieting** the **Irritable Stomach** in **Pregnancy**, for **Rapidly Restoring** the **Vital Forces** in **Hemorrhage**, for **Sustaining** and **Strengthening** in **Long** and **Exhausting Labor, Valentine's Meat-Juice** is Extensively employed in

Obstetrical Practice.

Dr. M. DeCristoforis, *Prof. Lecturer on Midwifery and Gynæcology, Milan, Italy:* "The preparation, VALENTINE'S MEAT-JUICE, has been successfully used by me in a serious case of acute puerperal hemorrhage. The patient could take no food or drink. VALENTINE'S MEAT-JUICE was completely retained and restored very promptly the strength and the cardiac impulsion."

Dr. E. Duloroy, *Physician Accoucheur to the International Hospital, Paris, France:* "A young accouchée, in a very weak condition and suffering from stomach trouble, could retain no food, but was able to assimilate VALENTINE'S MEAT-JUICE given at first in small doses. An improvement was quickly visible, the patient recovered her strength and is today in good health."

For Sale by European and American Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY,

A 11 **RICHMOND, VIRGINIA, U. S. A.**

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS.

No. 5663. **LONDON, SATURDAY, MARCH 12, 1932.** **CCXXII.**

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

ADDRESSES AND ORIGINAL ARTICLES.

The Pathology and Treatment of Anæmia. II.—The Anhæmopoietic Anæmias. By L. J. WITTS, F.R.C.P.—(*Illustrated*) 549

The Treatment of Diabetic Uræmia with Hypertonic Glucose Solutions. By H. W. FULLERTON, M.B., A. LYALL, M.R.C.P., and Prof. L. S. P. DAVIDSON, F.R.C.P.—(*Illustrated*).. 558

Specificity of the "Proteose" Intradermal Reactions. By JOHN FREEMAN, M.D.—(*Illustrated*) 561

The Duration of the Red Lochia. By CHASSAR MOIR, M.D. 564

CLINICAL AND LABORATORY NOTES.

A Case of Apparent Urinary Myiasis. By J. GORDON, M.D., D.P.H., and G. ROSEMONT, M.B. 565

Recurrent Ruptured Tubal Gestation. By JOHN C. HODGSON, M.D. 565

Persistent Allantoic Diverticulum Causing Intestinal Obstruction. By J. E. A. BOUCAUD, M.B., and J. A. WATERMAN, M.B. 566

MEDICAL SOCIETIES.

Royal Society of Medicine: Section of the History of Medicine: Biochemistry and Medicine..... 567

Section of Anæsthetics: Anæsthesia for Major Throat Operations 568

Section of Therapeutics and Pharmacology: Allergic Disease 570

Brighton and Sussex Medico-Chirurgical Society: Backache in Women 572

REVIEWS AND NOTICES OF BOOKS.

Traité de technique opératoire oto-rhino-laryngologique. By Prof. Georges Portmann 573

A Text-book of Surgical Pathology. By Charles F. W. Illingworth, F.R.C.S., and Bruce M. Dick, F.R.C.S. 573

Ultra-violet Therapy. By Austin Furniss, L.R.C.P. 574

Röntgenuntersuchung und Strahlenbehandlung der Speiseröhre. By Dr. Josef Palugyay 574

Modern Methods of Feeding in Infancy and Childhood. By Donald Paterson, F.R.C.P., and J. Forest Smith, F.R.C.P. 574

Infection and Resistance. By Prof. Hans Zinsser, M.D. 574

LEADING ARTICLES

THE LAW OF MEDICAL PATENTS 575

STAPHYLOCOCCAL IMMUNITY 576

PSYCHALGIA 577

ANNOTATIONS.

Ventilation of Roadway Tunnels..... 578

Return Cases of Scarlet Fever 578

Mortality Among Sanatorium Patients after Discharge 579

Vitamin Standardisation: Standard Curves of Response 580

Pleurisy Among Hospital Nurses..... 580

The Organisation of Resuscitation Measures .. 580

Dangerous Drugs 581

Exfoliation of the Lens Capsule 581

Cinema Welfare 581

The Royal Society..... 582

NEW INVENTIONS.

Illuminated Direct Laryngopharyngoscope. By E. Watson-Williams, F.R.C.S.—(*Illustrated*) .. 566

SPECIAL ARTICLES.

The Coastal Health Resort: Its Value and Development 583

THE LANCET Commission on Nursing: Collected Recommendations.—(*Concluded*)..... 585

Medicine and the Law: Unsuccessful Claim against Surgeon for Negligence 588

Scotland: Pulmonary Tuberculosis: An End-result..... 597

Infectious Disease in England and Wales ... 582

PANEL AND CONTRACT PRACTICE.

Emergency Treatment.—Disciplinary Action: the Ministry of Health and the General Medical Council 589

CORRESPONDENCE.

Tuberculosis of Childhood (Dr. Peter Kerley)..... 590

Blood Transfusion in Purpura (Dr. Eileen Harvey) 590

Anaphylaxis from Beestings (Dr. A. L. Gregg) 590

Chronic Infections of the Lungs (Dr. Philip Ellman) 591

Euthanasia (Dr. Killick Millard)..... 591

Relief of Vesical Irritation (Mr. W. E. M. Wardill).. 591

PARLIAMENT.

Notes on Current Topics: The Wheat Bill.—Dangerous Drugs Bill.—London County Council Bill.—Veterinary Surgeons Bill..... 592

House of Commons: Health Insurance Expenditure.—Bread Prices.—Imported Milk and Public Health.—National Radium Trust.—The Indian Medical Service.. 594

OBITUARY.

Arthur Boulton, M.R.C.S. 596

Boston Elphinstone Fordyce, M.B..... 596

Robert Emmerson Brown, L.R.C.P. 596

Oliver Barber, M.D..... 596

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps.—Deaths in the Services 596

MEDICAL NEWS.

University of London.... 597

Christie Hospital, Manchester 582

Finances of the London Hospital 588

Hampshire Hospitals 595

International Society of Orthopædic Surgery.... 597

Territorial Army Medical Officers' Association.... 597

Lectures on Tropical Hygiene 597

Royal Medical Benevolent Fund 597

Radium Institute, London 597

Sheffield Hospitals' Contributory Fund 597

Nottingham General Hospital 597

Enlargement of Weymouth Hospital..... 597

Society of Public Analysts 597

King Edward's Hospital Fund for London 598

Victor Horsley Memorial Lecture 598

Contributory Patients and Medical Staffs 598

NOTES, COMMENTS, AND ABSTRACTS.

Prostatic Calculi 600

Aëdes Egypti at Baku.... 600

Physical Exercises for the Middle-aged 600

Medical Diary 598

Vacancies 599

Appointments 600

Births, Marriages, Deaths 600

THE LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY LIMITED

(FOUNDED 1892)

President: Sir JOHN ROSE BRADFORD, Bart., K.C.M.G., C.B., C.B.E., M.D., F.R.C.P., F.R.S.
Treasurer and Chairman of Council: C. M. FEGEN, M.R.C.S., L.R.C.P., D.P.H.
Trustees for the Reserve Fund:
Rt. Hon. LORD DAWSON, P.C., G.C.V.O., K.C.B., M.D., P.R.C.P. Sir JOHN ROSE BRADFORD, Bart., K.C.M.G., C.B., C.B.E., M.D., F.R.C.P., F.R.S. Sir SQUIRE SPRIGGE, M.D., F.R.C.P., F.R.C.S.

The Society was founded for the following purposes: To protect, support, and safeguard the character and interests of legally qualified Medical and Dental Practitioners; to advise and assist Members of the Society in matters affecting their professional character and interests; and to indemnify them in regard to actions, etc., undertaken on their behalf.

The Society is fully insured to an unlimited extent against all adverse costs and damages which may be awarded against Members in any action which the Society undertakes on their behalf.

Annual Subscription: £1. Entrance Fee: 10s. Assets exceed £50,000.
No entrance fee to those joining within 12 months of registration.

Application form, and full particulars, from the Secretary, Victory House, Leicester Square, W.C. 2.
Telephone: GERRARD 4314.

WHY IT IS PRESCRIBED FOR GASTRIC PATIENTS

When ordinary tea is out of the question it is essential that only really good China should be drunk. The Doctor's China Tea has won the enthusiastic approval of practitioners simply because it is a perfect blend of a good China leaf **with all excess tannin eliminated.** It can therefore be prescribed for invalids and dyspeptics with safety—it has no ill after-effects.

THE DOCTOR'S CHINA TEA

HARDEN BROS. & LINDSAY, LTD.,
Dept. 136, 30-34, Mincing Lane, London, E.C.3.

Priced at 3/- and 3/8 per lb.
A super quality at 4/2 per lb.

CVS.

ARANDORA STAR CRUISES

SUN-Cruising in a British Liner is the only way in which you can travel abroad without benefit to foreign Ships, Railways or Hotels. All your expenses are paid in England—to a British Company.

No holiday in all the world can approach the novel charm of a Sun-Cruise on this superb vessel. As your eye is daily enchanted by new scenery, your body and mind are refreshed by comfort and charm such as have never before been attained in all the proud traditions of the sea.

MEDITERRANEAN CRUISES

- To Gibraltar, Palermo, Nauplia, Athens, Rhodes, Haifa, Port Said (for Cairo), Malta, Sousse, Algiers
  March 18. 29 Days. From 50 Gns.
- To Tangier, Palma, Palermo, Kurcola, Venice, Split, Dubrovnik, Corfu, Sousse, Phillippeville, Malaga
  April 22. 25 Days. From 45 Gns.
- To Lisbon, Tangier, Casablanca, Las Palmas, Teneriffe, Madeira, San Sebastian (for Biarritz) May 21. 18 Days. From 28 Gns.

Details of all "Arandora Star" sunshine cruises from
THE BLUE STAR LINE
3, Lower Regent St., London, S.W.1: (Ger. 5671)
Liverpool: 10, Water St. & Principal Tourist Agents

CVS-68

OXYGEN in cylinders from 10 c.ft. to 150 c.ft. capacity for inhalation. *N_2O*, *CO_2*, *Ethylene* (*and mixtures of gases to suit special requirements*). *Pipelines* for supplying oxygen direct to theatres and wards from basement. *Equipment* for the inhalation of oxygen; *regulators*; *gauges*.

THE BRITISH OXYGEN CO., LTD.

London, N.18, and Branches.

269

ADDRESSES AND ORIGINAL ARTICLES

THE PATHOLOGY AND TREATMENT OF ANÆMIA.

By L. J. Witts, M.D. Manch., F.R.C.P. Lond.,
ASSISTANT PHYSICIAN TO GUY'S HOSPITAL; WILL EDMONDS CLINICAL RESEARCH FELLOW.

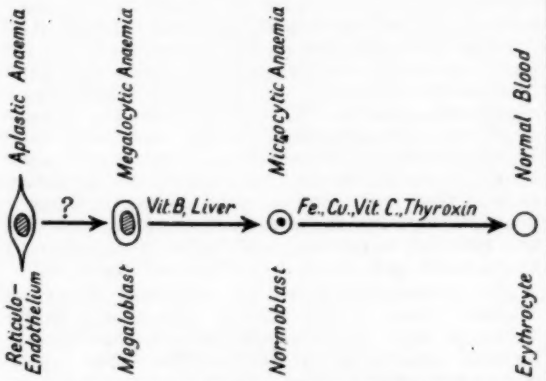
LECTURE II.

THE ANHÆMOPOIETIC ANÆMIAS.*

"The volume of blood depends on the quantity of nutriment dissolved and absorbed by the digestive tract."
Samuel Fenwick, "Atrophy of the Stomach," 1880.

In this second lecture I propose to discuss the anæmias which result from disturbances of nutrition and disorders of the alimentary tract. They form a group which impresses both by its size and its unity. It is my opinion that all are of nutritional origin. The normal human diet contains substances which are necessary for the maturation of megaloblast into normoblast, such as vitamin B and the active principle of liver, and others which are necessary for the maturation of normoblast into erythrocyte, such as vitamin C, thyroxin, iron, and traces of other minerals. Animal experiments [16] suggest that food substances are also necessary for the development of the megaloblasts from the reticulo-endothelium of the marrow, and that their absence leads to aplasia. Anæmia arises whether these substances are not supplied with the diet or whether they are not absorbed in digestion.

Fig. 1.



Scheme of anhæmopoietic anæmias showing point of action of the substances essential for blood formation.

The anæmia is due to diminished blood formation or anhæmopoiesis, and according to the level at which hæmopoiesis is arrested, the marrow may be normoblastic, megaloblastic, or aplastic. The cells drafted into the circulation from this dysplastic marrow are sometimes abnormal and liable to early destruction, but hæmolysis is always secondary to the degeneration of the bone-marrow, and is never of high degree. The reticulocyte count is low, the resistance to hypotonic saline is little impaired, and hæmoglobinæmia and hæmoglobinuria never occur. The white cells and the platelets are normal or diminished. Remission of the disease is attended by an outpouring of reticulocytes in numbers directly proportional to the extent of the hyperplasia of the bone-marrow. All these features are in direct contrast to the hæmolytic anæmias, which will be described in the next lecture. Clinically these anæmias are characterised by their frequent association with glossitis, gastro-intestinal disorders, and degeneration of the nervous system.

Some of these anæmias are simple and uncomplicated: the nutritional anæmia of infancy is entirely due to shortage of minerals in the milk, and the anæmia of scurvy to shortage of vitamin C. In others the effects of one deficiency predominate in the blood picture, but traces of other defects may be recognised, as when iron deficiency occurs in Addison's anæmia,[8] or of the liver principle in simple achlorhydric anæmia.[14] In other cases, again, the symptoms of multiple deficiency may be present together, as in the anæmia of pellagra or in tropical macrocytic anæmia. The blood picture may change during the evolution of the primary disease. Megalocytic anæmia is very constant in Addison's anæmia, but it is not uncommon for the disease to begin as a microcytic anæmia, and more rarely it terminates in aplasia. This sequence of events is almost the rule in sprue.

Anæmia from Defective Nutrition.

The divisions I have made of this group of nutritional and alimentary anæmias are for convenience of presentation, for it is clear that nutritional defects may lead to disease of the alimentary tract, and that alimentary disease may lead to ingestion of an imperfect diet, either from appetite or from prescription. For brevity I shall use the terms hypochromic, orthochromic, and hyperchromic for anæmias in which the colour-index is below unity, unity, and above unity respectively.

Nutritional anæmia of infants.—Anæmia of moderate degree is present in practically all infants, whether fed by the breast or artificially. It may become very severe, especially in twins and premature babies, who come into the world with a small store of iron, or after intercurrent infection, or when suckling is protracted beyond the normal period. It disappears spontaneously on the adoption of a mixed diet. Helen Mackay has made a comprehensive and illuminating study of this anæmia, which appears to be a pure mineral deficiency, resultant from the low iron and mineral content of the milk and reparable by inorganic salts of iron.

The anæmia of scurvy.—Mettier and co-workers have recently discussed the anæmia of scurvy and have shown that severe hypochromic anæmia is often present in cases where no bleeding has occurred. The bone-marrow is moderately hyperplastic. The anæmia does not respond to iron, or to liver extract which has been deprived of its vitamin C (though still effective in pernicious anæmia), but there is a prompt response of reticulocytes and rapid regeneration of the blood on administering foods which are rich in vitamin C. They suggest that when vitamin C has been chronically deficient its replenishment promotes the development of the nucleated erythrocytes, and so permits a reticulocyte response and repair of the anæmia.

* The second Goulstonian Lecture for 1932, delivered before the Royal College of Physicians of London on March 3rd. Lecture I. appeared last week.

TROPICAL NUTRITIONAL ANÆMIA.

Apart from the anæmia of infants fed on milk alone, defective diet is rarely responsible for anæmia in the temperate zones, though Minot[46] and others[34] have reported cases of anæmia of a megalocytic type which appeared to be due to prolonged restriction of diet, and which responded to treatment with liver. It is far otherwise in the tropical and subtropical zones, and in India, Africa, and China, a large fraction of the population maintains life on diets which are incredibly poor by western standards and which contain insufficient material for normal erythropoiesis. They are lacking in total calories, in protein, especially animal protein, in vitamins, and in mineral salts. Wills and co-workers have shown that the level of the blood count in various classes in India is directly proportional to the level of nutrition, and that malaria, hookworms, and similar anæmising influences can be ruled out of question in many instances. The anæmia is referable to dietetic defects alone, and it is often associated with skeletal deformities and œdema of a nutritional type. It is more common in women than men, and it may be hypochromic, orthochromic, or hyperchromic.

A striking feature of the anæmia is its tendency to assume a profound degree and a megalocytic type in pregnancy, though other influences may produce a similar aggravation, in men as in women. Indeed, the common occurrence of severe and often fatal megalocytic anæmia in pregnancy in Indian women first attracted attention to these anæmias. Medical advice is rarely sought before the last months of pregnancy when the patient is already profoundly anæmic. Fever, diarrhœa, and vomiting are marked symptoms, and the disease is more common in the second half of the year when diarrhœa is common. The tongue may be sore, and occasionally burning sensations pass down the fauces. The test-meal is normal, and there are no cord changes. The average red cell count is below a million, the mean diameter of the cells is increased, the colour-index well above unity. There is no jaundice or hyperbilirubinæmia, reticulocytes and nucleated red cells are infrequent, and normoblasts are more common than megaloblasts. The white cells are normal. If no treatment is given death occurs in about 40 per cent. of cases; post mortem there is hæmosiderosis of the liver and spleen, and aplasia of the marrow alternating with areas of megaloblastic hyperplasia.[4] If recovery occurs without treatment, or if treatment is insufficiently prolonged after confinement, the patient recovers to a certain extent, and then remains with a moderate anæmia, often of low colour-index. In the megalocytic phase the anæmia can be successfully treated not only with liver, but with marmite, a yeast extract rich in vitamin B. With either remedy there is a reticulocyte crisis and rapid improvement in the blood. Liver is rich in vitamin B, and it is probable that the curative effect of liver and marmite in tropical macrocytic anæmia should be ascribed to the vitamin B. Vitamin B is of no value in true Addison's anæmia,[13] and close as is the resemblance between tropical macrocytic anæmia and Addison's anæmia, they are undoubtedly due to different defects. The needs of the erythron are complex. For the maturation of normoblasts into erythrocytes, we already know that iron, thyroxin, and vitamin C are essential; for the maturation of megaloblasts into normoblasts, vitamin B and the nitrogenous complex of liver which is effective in Addison's anæmia.

It is important to remember that similar exacerbations of the anæmia occur in males and in non-pregnant women. There is no sign of hæmolysis, and the disease is quite different from the rare hæmolytic anæmia of pregnancy of the temperate zones. On the other hand, the very large number of cases of "pernicious anæmia of pregnancy" which have been described in the southern States of the U.S.A. seem to belong to this same nutritional, anhæmopoietic group. They are characterised by similar symptoms, glossitis, gastro-intestinal disturbances, incomplete repair of the anæmia after pregnancy, and a strong tendency to recurrence in subsequent pregnancies, and the diet seems to be very faulty.[2 48 60 61] Here also most probably belong some of the cases diagnosed as sprue without diarrhœa, in which severe anæmia develops during pregnancy.[28 36] Tropical nutritional anæmia has been extensively studied in China by Keefer and co-workers, who have found that it can be most effectively treated by a combination of liver and iron. It is indeed obvious from descriptions of the diets that there must be deficiency of several of the principles necessary for blood formation.

Pernicious Anæmia.

Pernicious anæmia has been so much discussed in recent years that the main facts can be briefly summarised. Addison's classical account was supplemented by precise descriptions of the blood and the blood-forming organs by Ehrlich and his pupils, while other continental workers demonstrated the increase in bilirubin in the blood and the excretions. Price-Jones showed that the megaloblastic degeneration of the bone-marrow was associated with an increase in the mean diameter of the erythrocytes and the presence of megalocytes in the circulation. Hurst and co-workers demonstrated the essential unity of Addison's anæmia and subacute combined degeneration of the spinal cord, and proved that achlorhydria was the rule in both conditions. Typical Addison's anæmia was cured by restoration of the gastric secretion, either spontaneously or after removal of septic foci and lavage,[12 30] while in a significant number of cases Addison's anæmia developed after operations on the stomach.[31] The Boston school of hæmatology, in one of the most beautiful researches in the history of medicine, showed that liver, stomach, and kidneys contain a principle curative in pernicious anæmia, and that this principle is normally elaborated in digestion by the stomach and stored in the liver and kidneys.[11]

The gastrogenous theory of pernicious anæmia is founded on a firm basis of fact. The essence of this theory is that the stomach contains a rennin-like ferment, which is not hydrochloric acid, nor pepsin, nor rennin, and that this "intrinsic factor" acts on the proteins of the food to produce a hæmatinic principle, which is necessary for the maturation of megaloblasts into normoblasts and the normal delivery of red cells into the circulation. The hæmatinic principle is more active parenterally than by mouth, and it is almost certain that it acts directly on the erythron, and not on the alimentary tract or the organisms contained therein. Its action is to stimulate the production of red cells and not to check hypothetical hæmolysis. The discovery of the intrinsic factor of the stomach has solved many of the problems of pernicious anæmia. The secretion of acid, pepsin, and intrinsic factor need not run parallel. The intrinsic factor may be present in cases of anacidity, and it may be absent with a free secretion of hydrochloric acid. It is thus explained

why the blood picture may be normal in patients with achlorhydria, while a megalocytic anæmia may develop in patients with hydrochloric acid in the gastric secretion.

The mere absence of acid seems to play little part in the development of glossitis, megalocytic anæmia, or subacute combined degeneration of the cord. Physiologists [10] have long been sceptical of the antiseptic action attributed to the gastric juice, on which depended the theory that pernicious anæmia was due to hæmolysis by toxins elaborated by organisms in the alimentary tract, and much clinical evidence is at variance with this theory. To the hæmatologist the chief function of the gastric hydrochloric acid is to dissolve the mineral elements of the diet, while the ferments are infinitely more important in Addisonian anæmia. It is conceivable that bacteria and parasites in the alimentary canal may destroy the hæmatinic principles of the food by their metabolic activities, and so indirectly influence the erythron. When we consider the intestinal diseases, we shall see that the secretion of hydrochloric acid by the stomach may be normal in cases where we have most reason to suspect this process, and we shall see that it often happens that the intestinal disease starts first and achlorhydria develops later. Intestinal infection cannot account for the fact that predigested liver is ten times as effective as raw liver in pernicious anæmia.[50] The natural conclusion from the evidence is that pernicious anæmia is the result of impaired gastric digestion and the consequent impoverishment of the plasma in the building stones for erythropoiesis.

Yet the gastrogenous theory of pernicious anæmia cannot be accepted without qualification. It is true that pernicious anæmia has developed in so many patients after operations on the stomach that we hardly need to postulate any inborn weakness of the hæmopoietic system for its development. Nevertheless, good health may be maintained for years without a stomach. In experimental animals removal of the whole stomach produces no glossitis, stomatitis, or nervous symptoms; anæmia occurs rarely, it is of the secondary type, and it is usually attributable to some additional strain such as pregnancy or diarrhœa.[31] Few human patients survive a complete resection of the stomach for very long, as the operation is seldom performed except for carcinoma, and death from metastasis occurs within two years. Of the 34 cases collected by Uhlhorn in 1927 only four were known to have survived longer than two years, and only one longer than four years. Nevertheless, all had lived some weeks or months after the operation, and there was only one doubtful instance of pernicious anæmia in the whole series (Moynihan's case, which was probably not pernicious anæmia [30]). When pernicious anæmia develops after subtotal gastrectomy, the interval of time is often more than five years, and it has been as long as 16 years.

It seems as if the human organism, like the animal, can compensate over long periods for the absence of the stomach. The final breakdown may be due to exhaustion of the hæmatinic reserves, the growth of an abnormal intestinal flora, or the failure of intestinal digestion. Those who cling to the old theory of intestinal infection in pernicious anæmia may think that the deciding factor is the intestinal flora, but when we consider the frequency of megalocytic anæmia in fatty diarrhœa and after intestinal resection, we shall probably conclude that it is a matter of the efficiency of digestion and assimilation in the intestine. While the results of gastrectomy show that a healthy intestine can compensate for the failure or absence of the stomach, there is evidence on the other hand that disorders of the intestine may nullify the effects of perfect digestion in the stomach. We seem driven to the view that in pernicious anæmia either gastric or intestinal digestion, or both, may be at fault.

Barnett has described an atypical case of pernicious anæmia, in which it seemed probable that intestinal absorption was at fault. The blood was typical of Addison's anæmia, but there was a good secretion of free HCl by the stomach. The anæmia responded to liver treatment. Nevertheless, Barnett was able to show that the gastric juice contained the "intrinsic factor" by carefully controlled experiments, in which another patient with pernicious anæmia was treated with beef muscle predigested in the juice.

Before leaving the subject of pernicious anæmia we may mention several points in which it differs from other megalocytic anæmias. These are: (1) the primitive character of the megaloblasts sometimes present; (2) the high degree of bilirubinæmia, bilirubin excretion, and hæmosiderosis; (3) the hypersegmentation of the polymorphonuclear cells. Much has been made of these differences by some hæmatologists, but the accumulation of knowledge has convinced the majority that the changes in pernicious anæmia shade indefinitely into those of other megalocytic anæmias. It is characteristic of pernicious anæmia that nutrition is well maintained. Apart from the subacute combined degeneration of the spinal cord, there is a pure and uncomplicated absence of the hæmatinic principle necessary for the maturation of megaloblasts into normoblasts. We should therefore expect in pernicious anæmia the most striking effects of megaloblastic degeneration of the bone-marrow, uncomplicated by the disturbances of the general health and of the iron and pigment metabolism, which accompany other alimentary and nutritional diseases. It is for this reason that the bilirubin excretion is so much higher and the megaloblasts so primitive. As regards the bone-marrow it may be noted that a thorough examination always reveals some areas of complete aplasia, though the majority of the bones contain hyperplastic marrow.

Simple Achlorhydric Anæmia and Allied Anæmias.

The new work on pernicious anæmia and its specific treatment with liver has caused a revival of interest in a form of anæmia in many ways related to pernicious anæmia, but differing from it in its unresponsiveness to liver and its curability by iron.[72] In this anæmia, which occurs almost exclusively in women, the colour-index is low and van den Bergh's reaction negative. It resembles pernicious anæmia in its association with achlorhydria—80 per cent. of my large series of cases—splenomegaly, and glossitis. It differs from it in the absence of degenerative changes in the spinal cord and in the presence in some cases of dysphagia, due to a backward spread of the inflammation of the mouth and tongue to the pharynx, a phenomenon rare in pernicious anæmia, though well known in tropical nutritional anæmia, sprue, and pellagra. Not a great deal is known of the morbid anatomy, but there appears to be a moderate normoblastic hyperplasia of the bone-marrow, a simple hyperplasia of the spleen, and no change in the other organs. The red cells are usually smaller than normal, and very deficient in hæmoglobin. Treatment with iron salts repairs the anæmia, and the red cells return to their normal size and hæmoglobin content.

There is reliable evidence that the anæmia is due to shortage of iron, caused partly by improper food and partly by defective absorption from the alimentary canal. Iron is best absorbed from an acid medium, which explains the significance of achlorhydria. In those who have normal gastric secretion there are usually symptoms of intestinal dyspepsia. Anæmia is not uncommon in chronic abdominal invalids as a result of their restricted diet and poor digestion. Lyon estimated the hæmoglobin in 100 women with uncomplicated retroversion of the uterus, confirmed by operation, and found a third with only 70 per cent. or less hæmoglobin. This microcytic anæmia is practically confined to the reproductive epoch, and it is much aggravated by pregnancy. It persists with varying intensity throughout the child-bearing period, and then tends to improve spontaneously after the menopause. Seven women whom I have treated by the induction of an artificial menopause have all done well and remained free from relapse. Seppänen has clearly shown that women are more liable to anæmia than men, and the sex-incidence of simple achlorhydric anæmia can be explained by the greater frequency of achlorhydria and chronic abdominal invalidism in women, and by the strain of their reproductive life.

We have been specially interested in the gastric secretion in these cases of achlorhydria and anæmia. Until lately it seemed inexplicable why achlorhydria should sometimes be associated with perfect health, at other times with a microcytic anæmia, and at others with a megalocytic anæmia. Whether microcytic anæmia develops or not seems purely a matter of the iron metabolism. The normal diet provides only a small positive balance of iron, especially for women who are menstruating and bearing children, and this soon becomes a deficit if the diet is poor and absorption is diminished by achlorhydria. For the explanation of the megalocytic anæmia we are indebted to Castle's brilliant hypothesis. S. J. Hartfall and I have found that the subcutaneous injection of histamine into patients with simple achlorhydric anæmia or with pernicious anæmia induces a small secretion of gastric juice, and that in simple achlorhydric anæmia this juice may be as deficient in acid and pepsin as in pernicious anæmia. To ordinary tests they are identical. Nevertheless, on incubating beef with juice from simple achlorhydric anæmia, we obtained the curative principle for pernicious anæmia. We found that beef incubated with the gastric juice of a patient with pernicious anæmia produces no effect. Beef incubated with the gastric juice of a patient with simple achlorhydric anæmia usually causes a small reticulocyte crisis. Beef incubated with normal gastric juice is approximately as effective as an equivalent amount of liver. Thus the gastric juice in simple achlorhydric anæmia, and in patients who are normal except for achlorhydria,[11] contains Castle's intrinsic factor and protects the individual from pernicious anæmia.

In pernicious anæmia the damage to the gastric mucosa is higher in degree or different in kind from simple achlorhydric anæmia. The secretions usually fail in the order HCl, pepsin, intrinsic factor, but in rare cases the intrinsic factor may disappear and pernicious anæmia develop though acid and pepsin are conserved. A case may begin as simple achlorhydric anæmia and later pass into pernicious anæmia, because the secretion of HCl and intrinsic factor is successively exhausted. Partial recovery may occur and the pernicious anæmia give place to simple achlorhydric anæmia with the return of the intrinsic factor, HCl remaining suppressed. Members of families where a vulnerable gastric mucosa is inherited may differ in their response to the wear and tear of life, some developing pernicious anæmia from the complete failure of the gastric mucosa, others simple achlorhydric anæmia or a symptomless achlorhydria from its partial failure. Finally, we can understand how the digestion of the food may be perfect and yet anæmia develops owing to defective absorption from the intestine, and so a megalocytic anæmia may develop in spite of the presence of intrinsic factor in the stomach, or—much more commonly—the microcytic anæmia of iron deficiency develops in spite of a normal secretion of hydrochloric acid. Here we must leave Castle's hypothesis for further testing—and in my opinion for a certain modification—in the future.

Diseases of the Intestines.

In the study of anæmia in intestinal disease we are faced with more intricate problems than in the nutritional and gastrogenous anæmias. In addition to the intestinal disease there may be an imperfect diet and an impaired gastric digestion. The frequency of achlorhydria and glossitis in intestinal disease is remarkable. It is often assumed that this achlorhydria is primary, but while achlorhydria may favour infection of the intestine, we have unimpeachable evidence that achlorhydria may be the result of disease of the intestines, developing during the evolution of the illness, and often giving place to normal secretion on its cure, as I shall show when we consider intestinal stenosis, tapeworm infestation, sprue, and chylous diarrhœa. The mechanism of this action on the stomach is obscure. Morbid changes in the intestine may spread directly to the stomach, or irritant or infective material may ascend by reverse peristalsis. Lycopodium spores or other finely divided and easily recognisable material given in enemata can travel in a few hours from the rectum to the stomach, and lycopodium powder swallowed in sealed capsules may later be recovered from the mouth.[3] There is no difficulty about the mechanism of this process but it presumes an unknown irritant. There is less difficulty in supposing that nutritional disorders of a pellagroid type develop when absorption from the intestine is diminished by disease, with consequent glossitis and achlorhydria.

Another problem in the intestinal anæmias is the relative importance of disease of the stomach and of the intestine in their production. Is the usual sequence of events intestinal disease→gastric disease→anæmia, or do both stomach and intestine play a part in the anæmia? Estimation of the acidity of the contents of the stomach does not help us, and we shall not solve the problem until a simpler technique has been devised for the detection of the intrinsic factor of Castle in the stomach. We shall do well not to underestimate the intestinal factor, for Barnett's important case, which I have already quoted, shows that a megalocytic anæmia may develop in spite of the secretion of the intrinsic factor by the stomach.

RESECTION OF THE SMALL INTESTINE.

Resection of the small intestine, usually done on account of tuberculosis, provides the simplest examples of anæmia from intestinal disease. The literature [58] contains records of more than 90 patients who have survived the loss of over 2 metres of small bowel. There is little information about their state of health, though it is clear that they often suffer from diarrhœa and debility. The following three cases suggest that anæmia is a common sequel. It

is associated with malabsorption of fat, and should be compared with the anæmia of chylous diarrhœa, sprue, and gastro-colic fistula. Achlorhydria is usually present. Again, the problem is whether achlorhydria precedes intestinal ulceration, the sequence being achlorhydria→intestinal ulceration→resection→anæmia, or whether, as seems more probable from the analogy of other fatty diarrhœas, achlorhydria and anæmia are the result of the intestinal resection and fatty diarrhœa. The anæmia may be simple or pernicious in type.

Becker (1930) describes the case of a 29-year-old woman who was operated on for tuberculous stenosis in several parts of the lower small intestine. At the time of the operation she did not show any remarkable paleness. Over 2 metres of the small intestine and the first part of the cæcum were removed, and she was freed from the stenosis troubles. Two months after the operation she began to notice œdemata and to feel tired. When five months after the operation she was taken to the hospital, she had a typical pernicious anæmia. The œdemata were quite large. On treatment with liver, there was a reticulocyte crisis and rapid improvement. The œdemata diminished but did not disappear. The patient was then taken ill with a double-sided otitis and erysipelas. She died in septicæmia. Post mortem it was established that a stenosis no longer existed.

Saltzman has reported a similar case in a woman of 28, who first came under treatment four years after the resection of 222 cm. of jejunum. She now had pernicious anæmia with achylia, which followed the usual remittent course and which responded to liver.

Adamson and Smith observed "chronic chlorosis" in a man several years after the resection of 4 feet of small bowel.

INTESTINAL STENOSIS.

The association of pernicious anæmia with intestinal stenosis has been known for many years, and Meulengracht was able to collect accounts of 20 cases in 1929.[43] The strictures are usually tuberculous, and involve the lower part of the small intestine, occasionally the upper part of the colon. The tongue, the nervous symptoms, the blood, and the bone-marrow are all typical of pernicious anæmia. In Meulengracht's cases complete achylia was demonstrated in every case on which a test-meal was done; in one of his cases the test-meal was normal six years before the anæmia developed, but achlorhydria was present when the anæmia was detected. Becker (1930), Little, and A. F. Hurst (personal communication) have since described cases in which there was a normal secretion of hydrochloric acid. Thus achlorhydria is not an integral part of the disease, and it may be the result of the intestinal stricture. The anæmia responds to liver treatment with a reticulocyte crisis and prompt regeneration of the blood.[7 27 43 63] Seyderhelm's patient recovered without other treatment when the stricture was resected. Little's patient relapsed on omitting liver after the normal anatomy of the intestine had been restored, but diarrhœa was still present, and the normal function of the intestine had obviously not been regained.

The coexistence of such rare conditions as pernicious anæmia and intestinal stenosis points to an ætiological connexion, which was proved when Seyderhelm produced pernicious anæmia in two out of ten dogs by ligating the small intestine. He showed that the onset of anæmia was more closely related to the growth of an abnormal intestinal flora than to the degree of narrowing of the gut. He suggested that pernicious anæmia was due to the absorption of bacterial poisons from the intestine, that their growth was favoured by achylia, and that their absorption was due to abnormal permeability of the intestinal wall. There is no evidence that toxins are absorbed or circulate in pernicious anæmia, or that toxins can produce pernicious anæmia. It is simpler to assume that if the intestinal bacteria play a part, it is either the destruction of the hæmatinic principles of the food by their metabolic activities, or the impairment of digestion and assimilation by their local effects on the mucosa of the stomach and intestine. In conclusion, I should like to point out that the anæmia of intestinal stenosis is not always, and perhaps not most frequently, of the megalocytic type, for a hypochromic anæmia may develop in simple stenosis of the intestine, where there is no hæmorrhage or gross infection and toxæmia.

Miss A had operations for tuberculous glands in the neck and the mesentery at the age of 14. In adolescence she suffered from bilious attacks for which her gall-bladder and appendix were removed without benefit. At the age of 20 she was found to have chronic duodenal stasis, ileal stasis, and calcified abdominal lymph glands; the test-meal was normal, and the hæmoglobin 85 per cent. At the age of 22 she had definite obstruction of the terminal loop of the ileum, which was dilated, half full of gas, and lifted out of the pelvis; there was no occult bleeding; the blood count was: red cells, 3,880,000 per c.mm.; white cells, 8000; Hb., 64 per cent.; colour-index, 0·83. She was treated by Dr. Hurst with a low-residue diet, belladonna, liquid paraffin, and grs. 75 of iron and ammonium citrate a day, and two years later her symptoms were much better, the obstruction had diminished, and the hæmoglobin was 87 per cent.

A man, aged about 40, was readmitted to Guy's Hospital six months after an operation for strangulated hernia. He now had a stricture of the ileum and a moderate hypochromic anæmia. He succumbed to the operation for the relief of the stricture, and I found normoblastic hyperplasia of the bone-marrow in the centre of the humerus.

INTESTINAL PARASITES.

Much of the literature of the association of pernicious anæmia with intestinal parasites is uncritical, and the subject is worthy of careful review by one interested in hæmatology and parasitology. Many intestinal parasites have been reported in association with pernicious anæmia, but the only one which occurs with any frequency is *Dibothriocephalus latus*. Even so, pernicious anæmia from *D. latus* infestation is rare, and it has been calculated that in Finland, where many are infested with this worm, only from 0·1 to 0·5 per cent. of those infested develop anæmia. It also appears that the victims of *D. latus* anæmia are often predisposed to pernicious anæmia by heredity or by achlorhydria. Achlorhydria occurs in over 80 per cent. of cases, but it is sometimes the result of the disease, and free acid may return when the worm is expelled.[45 69] *D. latus* anæmia is of great interest, inasmuch as it may be repaired either by expulsion of the worm or by treatment with liver. Expulsion brings about a complete cure, while liver merely repairs the anæmia, which will relapse if liver is discontinued, and the parasite allowed to remain.[7] Many attempts have been made to explain *D. latus* anæmia by the liberation of hæmolysins from the parasite, but opinion is now changing to the view that it depends on the destruction of the hæmatinic principles of the food by the parasite, or diminished intestinal absorption.

GASTRO-INTESTINAL ULCERATION.

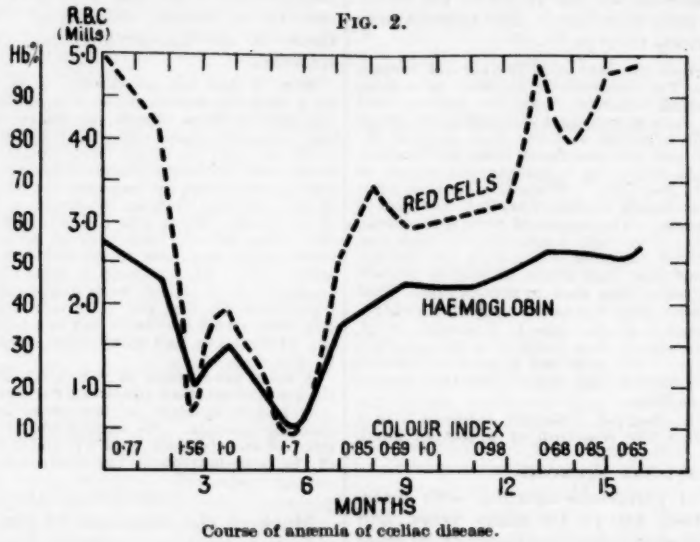
Many instances have been reported of pernicious anæmia in association with cancer of the stomach,[59] dysentery, and tuberculous ulceration of the bowel.[32] Complex factors are at work in these cases, such as achylia, intestinal dyspepsia, hæmorrhage, toxæmia, and defective diet, but the anæmia may respond well, and with the typical reticulocyte crisis, to treatment with liver.

Fatty Diarrhœa.

Donald Hunter has described the disturbances in the metabolism of calcium and phosphorus which

occur in fatty diarrhœa, and the consequent changes in the skeleton. The effects of fatty diarrhœa on the erythron are equally striking. If fatty diarrhœa persists for more than a few months, anæmia almost always develops. It tends to pass through the following stages: (1) hypochromic anæmia with normoblastic marrow; (2) megalocytic anæmia with megaloblastic marrow; (3) aplastic anæmia. At any of these stages recovery or death may occur, according to the progress of the primary malady. Characteristic changes in the white cells are lacking, and there is no shift to the right as in Addison's anæmia. Aplastic traits appear early, and though van den Bergh's reaction may be positive in the megalocytic stage, it is not so constant nor so intense as in Addison's anæmia. Liver produces a reticulocyte crisis and repair of the anæmia in the megalocytic phase, but is apparently without action in the hypochromic and aplastic phases.

FIG. 2.



Course of anæmia of cœliac disease.

It is natural to attribute the anæmia of fatty diarrhœa to the disturbance of intestinal digestion. On the other hand, glossitis and achlorhydria are frequent in all forms of fatty diarrhœa, and in sprue Castle has shown that the intrinsic factor may be absent even though hydrochloric acid is secreted freely by the stomach. Defective gastric digestion may therefore play a part in the anæmia of fatty diarrhœa. There is little doubt that the achlorhydria is often the result of the fatty diarrhœa, for several cases have been reported in which gastric secretion was normal at the onset, depressed at the height of the illness, and restored on recovery.

TABLE I.—*Blood Changes in 39 Cases of Cœliac Disease (Fanconi).*

Hæmoglobin per cent.	No. of cases.	Red cells in millions.	No. of cases	Colour-index.	No. of cases.	White cells in thousands	No. of cases.
70–60	8	6–5	9	1·5	1	20–15	1
60–50	11	5–4	11	1·5 –1·25	2	15–10	9
50–40	7	4–3	15	1·25–1·0	2	10–7·5	11
40–30	7	3–2	2	1·0 –0·9	1	7·5–5·0	8
30–20	3	2–1	2	0·9 –0·7	15	5<	8
20–10	1	1–	1	0·7 –0·5	9	—	—
10<	2	—	—	0·5 –0·3	5	—	—

CŒLIAC DISEASE.

The blood changes in cœliac disease are evident from Table I., which summarises Fanconi's observations. In his 39 cases the hæmoglobin was below 60 per cent. in 31, and below 30 per cent. in 6. The various phases of hypochromic, megalocytic, and aplastic anæmia were clearly evident, and Fanconi observes that these are not separate entities but merely different degrees of anæmia, through which the same child may pass in the course of the illness (Fig. 2). In three of the 39 cases the blood picture was identical with that of Addison's anæmia—profound anæmia of the megalocytic type, leucopenia and thrombopenia, hyperbilirubinæmia, and excessive output of bilirubin derivatives in the fæces. They differed from Addison's anæmia in that the secretion of free hydrochloric acid by the stomach might be normal and complete cure might be obtained. In fatal cases aplasia of the marrow was found, but there was at times considerable hæmosiderosis.

SPRUE.

Sprue is a disease of tropical and subtropical countries, more often occurring in the newcomer and the better class of people. It is characterised by sore mouth and tongue, anæmia, fatty diarrhœa, loss of weight, and a tendency to remissions and exacerbations. Its ætiology is unknown. It is distinguished from pernicious anæmia not only by the characteristic diarrhœa, but by the low calcium content of the serum, the dilated colon, and the frequent presence of free HCl in the gastric juice. Subacute combined degeneration of the cord is a rarity in sprue, and I know of no case in which it has occurred along with a normal gastric secretion. Nevertheless, there are many cases which seem to share the features of sprue and pernicious anæmia, and which "in the tropics would be called sprue, while out of the tropics they would be called pernicious anæmia; the diagnosis is largely a matter of geography."[73] Such cases have been described by MacLester.

In a consecutive series of 26 cases Fairley and co-workers found hyperchlorhydria in 4, normal secretion in 7, hypochlorhydria in 8, and achlorhydria in 7; in the achlorhydric patients the chloride secretion was such as to suggest that some acid was secreted but was neutralised. Castle and co-workers found no "intrinsic factor" in sprue with megalocytic anæmia in spite of free secretion of hydrochloric acid. The number of such experiments is small, and it would be premature to conclude that the anæmia of sprue is always purely gastrogenous.

A woman described by Wood had typical sprue diarrhœa, but in addition achylia and subacute combined degeneration of the cord.

A patient of mine was in the West Indies for four months in 1914, at which time she was 23 years old, then returned to England, and worked as a nurse. She suffered continually from glossitis and anæmia. In 1924 she went to China, and 18 months after her arrival developed typical sprue. She came home in 1928 and made a good recovery on diet, liver treatment, and transfusions. In 1929 she went to Jerusalem, and there nearly died from pernicious anæmia.

When I saw her in 1931 the anæmia had recovered on treatment with desiccated stomach, but she had well-marked subacute combined degeneration of the spastic type.

The anæmia of sprue is usually not so severe as pernicious anæmia, and Fairley points out that while over 80 per cent. of cases of pernicious anæmia have less than two million red cells at the first examination, patients with sprue come with a red count between two and four million, and less than 20 per cent. are below this level. Exact knowledge of the hæmatology of sprue dates from the pioneer observations of Hampson and Shackle, who published Price-Jones curves from a number of cases in 1924, which showed a megalocytic anæmia. It is now known that the anæmia of sprue tends to pass through three stages.

1. An initial stage of slight anæmia, the colour-index being low, and the changes in the bone-marrow quite minute.
2. An intermediary stage characterised by hyperplasia of the bone-marrow with abundance of megaloblasts and megalocytic anæmia.
3. A final stage of hypoplasia or aplasia of the bone-marrow with the blood picture of aplastic anæmia.

There are less polychromasia and punctate basophilia than in pernicious anæmia, and nucleated red cells are infrequent, but true megaloblasts may occur. Hyperbilirubinæmia is uncommon, and there are no constant changes in the white cells. In the megalocytic phase the anæmia responds to liver with a reticulocyte crisis and an increase in the red cells and hæmoglobin, but liver has no effect in the hypochromic and aplastic phases.

In Fairley's 67 cases the colour-index was above unity in 61 per cent. It was never really low, for no case was below 0·7. During the first few weeks of illness the colour-index was found under unity in six out of seven cases, but shortly afterwards high indices were established and were maintained throughout the course of the disease. In 10 out of 11 cases, in all but one of whom the colour-index exceeded unity, the Price-Jones curve was shifted to the right. The bilirubin content of the blood was rarely increased. The bone-marrow, examined at death in eight patients, showed megaloblastic degeneration in three and aplasia in the other five. Fine granular pigment was constantly found in the liver and other tissues, but not all of it was iron, and hæmosiderosis was less striking than in pernicious anæmia.

Krjukoff's study of sprue in middle Asia gave results in correspondence with those of Fairley in India. Krjukoff (1927) noted that megalocytosis gave place to hypochromia during the stage of recovery. He examined the bone-marrow at biopsy, and found hyperplasia and megaloblastic degeneration in every case. This was most marked when the anæmia was of moderate severity, and at times it rivalled anything found in pernicious anæmia. Megaloblasts were present in early cases also, but the dedifferentiation of the bone-marrow was not so advanced and the megaloblasts were still capable of maturing into normoblasts and microcytes.

TABLE II.—*Blood Count in 67 Cases of Sprue.*

Hæmoglobin per cent.	No. of cases.	Red cells in millions.	No. of cases.	Colour-index.	No. of cases.	White cells in thousands	No. of cases.
>100	1	6–5	6	1·6	2	>15	3
100–80	17	5–4	13	1·6–1·4	2	15–10	8
80–60	29	4–3	18	1·4–1·2	14	10–7·5	9
60–40	13	3–2	18	1·2–1·0	23	7·5–5·0	19
40–20	6	2–1	11	1·0–0·8	20	5·0–2·5	22
20<	1	1–	1	0·8–0·6	6	2·5<	—

In Baumgartner's series of 36 cases, mainly patients from China under treatment in U.S.A., 16 had a megalocytic anæmia, 12 a hypochromic anæmia, and 8 no anæmia. In those with a megalocytic anæmia the mean diameter of the red cells was 8·2 microns, the range being from 5·9 to 10·7 microns, figures strictly comparable with those of pernicious anæmia. In one of the cases with hypochromic anæmia and very low hæmoglobin the cells were smaller than normal (6·7 microns), while in another they were larger (8·0).

CHYLOUS DIARRHŒA.

In recent years much interest has been taken in a nutritional disturbance in adults in temperate climates, which resembles cœliac disease and sprue, and which is often called non-tropical sprue. The symptoms are fatty diarrhœa, an extreme degree of emaciation, severe anæmia, low blood calcium with its associated sensory and motor phenomena, and a lowered rate of metabolism, all these latter symptoms apparently being due to malabsorption of food and minerals. Changes in the spinal cord are unusual, but Munford's patient developed signs of subacute combined degeneration in spite of normal secretion of hydrochloric acid in the gastric juice. The stools are copious, greasy, and pale, containing an excess of fatty matters, chiefly as split fats; *Monilia psilosis* is not found. Rontgen examination reveals a distended colon and decrease in the density of the bones. In cases coming to operation or autopsy obstruction of the lacteals by tuberculous or other disease has been found,[52] and this obstruction to the absorption of fat may well be the root cause of the disease. In other cases, however, no post-mortem changes have been detected.

The hæmatology of chylous diarrhœa is identical with that of sprue, as may be seen from Table III., which is compiled from 26 cases taken from the literature, 4 under the care of Dr. A. F. Hurst, and 2 of my own. The anæmia may be hypochromic, megalocytic, or aplastic. Van den Bergh's reaction was negative in all of 7 cases in which it was performed, but Hegler found hæmatinæmia, as in Addison's anæmia. Test-meals were done on 25 patients, and the result was normal in 11, hypochlorhydria in 4, and achlorhydria in 10. The tongue was normal in 6, inflamed in 17. Umber, in a reference which I have been unable to study, describes the post-mortem findings in the bone-marrow as those of aplastic pernicious anæmia. The following cases are of special interest:—

One of my cases, a man of 62, was first diagnosed as Addison's anæmia on the basis of glossitis, achlorhydria, and a blood count of red cells, 2,500,000 per c.mm.; white cells, 3400; hæmoglobin, 55 per cent.; colour-index, 1·1, with megalocytosis. Further investigation showed that van den Bergh's reaction was negative, there were translucent areas in the bones, and there were up to six fatty motions a day. The test-meal was repeated after lavage, when the secretion of HCl proved to be normal. On treatment with HCl and liver extract the diarrhœa decreased to two motions a day, the hæmoglobin rose to 64 per cent., and 9½ lb. in weight was gained. He died two and a half years later after developing so much scoliosis that "his spine seemed to have shrunken."

Mrs. B, aged 48, who has a strong family history of tuberculosis, has been under my observation for 18 months with fatty diarrhœa, glossitis, hypochlorhydria, and cramps in the legs. Her blood count when first seen was: red cells, 3,100,000 per c.mm.; white cells, 5200; hæmoglobin, 54 per cent.; colour-index, 0·85; negative van den Bergh reaction. She had thorough treatment with liver, desiccated stomach, iron, and hydrochloric acid, but made no improvement till she was placed on a low-fat diet with calcium and vitamin D.

Hegler's patient in the spring of 1922 had a blood count of red cells, 4,630,000 per c.mm.; white cells, 6000

hæmoglobin, 58 per cent.; colour-index, 0·6; van den Bergh's reaction was negative, and there was hyperchlorhydria. In May, 1923, the blood count was red cells, 1,100,000 per c.mm.; white cells, 5000; hæmoglobin, 30 per cent.; colour-index, 1·4; the test-meal now showed anacidity, and there was hæmatinæmia. In the summer of 1928 she was much better, and the blood count was: red cells, 4,500,000 per c.mm.; white cells, 6500; hæmoglobin, 70 per cent.; colour-index, 0·8.

In Holst's patient there was glossitis with normal gastric acidity. The blood was very carefully examined by Gram: red cells, 1,320,000 per c.mm.; white cells, 4000; hæmoglobin, 39 per cent.; colour-index, 1·5; megaloblasts were present; the Price-Jones curve was typical of an Addisonian anæmia; the mean diameter of the red cells 8·5 m., the mean volume 136 cubic microns, the icterus index was 4.

TABLE III.—*Blood Changes in 32 Cases of Chylous Diarrhœa.*

Hæmoglobin per cent.	No. of cases.	Red cells in millions.	No. of cases.	Colour-index.	No. of cases.	White cells in thousands	No. of cases.
99–80	6	5–4	12	>1·4	3	>15	1
79–60	10	4–3	8	1·39–1·2	5	15–10	3
59–40	12	3–2	6	1·19–1·0	9	10–7·5	6
39–20	3	2–1	5	0·99–0·8	9	7·5–5·0	14
19<	1	1–	1	0·79–0·6	6	5·0<	8

PANCREATOGENOUS DIARRHŒA.

Walko comments on the frequency of anæmia in chronic pancreatitis, and describes a case of pancreatitis with typical pernicious anæmia. Holler and Kudelka found mild anæmia and increased diameter of the red cells very constantly not only in chronic pancreatitis but also in jaundice and in cirrhosis of the liver without jaundice. It is probable that a number of different factors are at work in these cases, such as achlorhydria, fatty diarrhœa, changes in the portal blood pressure, and in the chemical composition of the plasma, so that no special significance can be attached to them. For example, Thaysen reports four cases of pancreatic disease, two of whom had mild anæmia with high colour-index, but all four had achlorhydria or hypochlorhydria.

GASTRO-COLIC FISTULA.

Gastro-colic and jejuno-colic fistulæ are usually the result of gastric carcinoma or of gastro-jejunal ulcer. The most constant symptom is fatty diarrhœa, the other food elements being much better digested than might be expected. Fairley and Kilner have reported three cases with glossitis and megalocytic anæmia, which bore a close resemblance to sprue. Two of them, both with normal gastric acidity, were treated with a high protein diet and liver with great improvement in the anæmia. Poynton and Macgregor have reported a case of gastro-colic fistula with anasarca and hypochromic anæmia; there was no active ulceration or bleeding. One cannot but be impressed by the frequency of glossitis and anæmia in fatty diarrhœa of such different origins, and by the similarity of the effects produced on the erythron and the skeleton. The natural conclusion is that they are the effects of diminished gastro-intestinal absorption of the hæmatinic principles and of the inorganic elements of the bones.

Pellagra.

The pathology of pellagra is still obscure. The primary lesions are confined to epithelial surfaces without extension to deeper tissues or organs. The cutaneous manifestations are well known, but it is important to note that "lesions of the mouth, tongue, and œsophagus are the most constant and consistent lesions of pellagra."[15] I have always been impressed by this likeness to the Plummer-Vinson syndrome, and by the fact that pellagra affects females twice as often as males. The stomach and small intestine show no consistent anatomical changes, but a colitis of variable intensity is present in every case. Peripheral neuritis and psychoses may develop, but there are no tract degenerations of the spinal cord like the subacute combined degeneration of Addison's anæmia. Achlorhydria is present in 85 per cent. of cases, hypochlorhydria in 9 per cent., and normal gastric secretion in 6 per cent.; diarrhœa is present in 60 per cent.[65]

Anæmia is not a striking feature in pellagra, which leads to death from other causes before the erythron is much affected, but there is nearly always some diminution in the cells of the blood and the proteins of the plasma. These are secondary effects of the disease, which represent impaired digestion or absorption of protein, and are dependent upon the injury to the alimentary tract. In 41 cases Krjukoff (1931) found the hæmoglobin below 70 per cent. in 20, and below 50 per cent. in only 4. The anæmia was hypochromic in 28, orthochromic in 8, and hyperchromic in 5. The serum was very pale even in patients with megalocytic anæmia. The marrow reaction was sometimes normoblastic, sometimes megaloblastic, sometimes aplastic, but usually a mixed reaction was present, and there was no close agreement between the blood picture and the marrow reaction. It would appear that the nutritional defect in pellagra is too extensive to allow such pure reactions as are found in simple and pernicious achlorhydric anæmia, and too intense to allow the sequence of reactions of normoblastosis, megaloblastosis, and aplasia, which take place in fatty diarrhœa. The usual findings in pellagra are a hypochromic anæmia and a normoblastic marrow with traces of megaloblastosis and aplasia.

Disease of the Thyroid.

The thyroid is the only endocrine gland disease of which is attended by anæmia. The thyroid was originally in communication with the alimentary canal, and the anæmia of hypothyroidism is very similar to the anæmias of nutritional and alimentary disease. As we might expect from animal experiments, which show that thyroxin stimulates blood formation,[54] hyperthyroidism per se does not give rise to anæmia.[35] But women who develop hyperthyroidism are often of the chronic abdominal invalid type, and many of them have achlorhydria. This probably explains the severe anæmias which are occasionally met with in women with hyperthyroidism.[21 23 51] Meulengracht observed pernicious anæmia 8 times in 151 women with hyperthyroidism; it developed relatively early in life, from 7 to 28 years after the onset of hyperthyroidism, and was of moderate severity.

In experimental animals thyroidectomy causes a hypochromic anæmia with moderate hyperplasia of the bone-marrow.[17 54] I have found little information about the bone-marrow in myxœdema, but there is apparently a mixture of hyperplasia and aplasia in varying degrees. Anæmia is present in some half of the cases but is rarely profound. The hæmoglobin is reduced to about the same extent as the red cells, or a little more, so that the colour-index is usually a little below unity. There are no marked changes in the size and shape of the red cells. Achlorhydria occurs in a rather high proportion of hypothyroid patients—4 out of 16 of Stone's cases and 3 out of 10 of mine. It is often permanent, and persists after

treatment of the thyroid deficiency, but Boenheim found the gastric acidity normal after thyroid treatment in two patients, who had had anacidity in the Ewald meal before. The clinical resemblance to pernicious anæmia may be great. Two of Stone's patients had been treated for pernicious anæmia without success; their metabolism was low, and their anæmia improved on thyroid treatment. In myxœdema there is no increase in the amount of bilirubin in the blood, and the size of the red cells is not increased.

As might be expected from their age-incidence and their association with achlorhydria, pernicious anæmia and myxœdema may coexist in the same patient, as in five cases reported by Means, in three of whom the pernicious anæmia preceded the myxœdema, in one the myxœdema developed first, and in the fifth there was no evidence which came first. Each disease responded to its own treatment, and their association appeared to be fortuitous. We need more information about the anæmia of thyroid deficiency, more especially as regards the behaviour of the bone-marrow, the permanence of the achlorhydria, and the specificity of the response to thyroid treatment. In my experience thyroid is of no value in any other anæmia. In the Plummer-Vinson sydrome, for which it has been specially advised, I have never been able to detect any effect. On the other hand, the anæmia of hypothyroidism does not respond to iron, arsenic, or transfusions, and probably not to liver.

Conclusion.

I am well aware that I have set myself and those who read this lecture an arduous task in surveying an enormous literature, and a wealth of clinical and experimental material. Much has of necessity been omitted. I have avoided discussion of subacute combined degeneration and allied nervous diseases, though they are susceptible of the same explanations as the disturbances of the erythron.[68] Apart from this nothing has been deliberately overlooked. The evidence I have presented shows that anæmia due to disturbance of erythropoiesis occurs in a variety of nutritional and digestive disorders. It is possible to explain each and all of these anæmias by the starvation of the organism in the materials necessary for blood formation. Some of these materials have already been isolated—iron, copper, thyroxin, vitamin B, vitamin C—and others, such as the active principle of liver, cannot long elude analysis. The starvation may be the result of imperfect diet, or of impaired digestion or assimilation. The anæmia is due to diminished blood formation, and it may be microcytic, megalocytic, or aplastic in type, according to the stage at which erythropoiesis is arrested. If we accept this explanation, we must revise many of our ideas about digestion, both in the stomach and in the intestine, but in so doing we may gain new light on digestive disorders. We must also believe that such infection of the mouth and gastro-intestinal tract as may be present in these diseases is usually secondary to the metabolic or digestive defect, and plays little or no part in the initiation of the anæmia, but it must be confessed that the bacterial and hæmolytic theories of these diseases have ill repaid the laborious investigations they have inspired. The field has been surveyed only, and many problems await solution. Time may play havoc with our theories, but the conception of a group of nutritional and gastro-intestinal diseases, closely related in signs, symptoms, and hæmatology, is likely to have a permanent place in pathology, medicine, and therapeutics.

REFERENCES.

1. Adamson, J. D., and Smith, F. H.: Canad. Med. Assoc. Jour., 1931, xxiv., 793.
2. Allan, W.: Surg., Gyn., and Obst., 1928, xlvii., 669.
3. Alvarez, W. C.: The Mechanics of the Digestive Tract, New York, 1928.
4. Balfour, M. I.: Indian Med. Gaz., 1927, lxii., 491.
5. Barnett, C. W.: Amer. Jour. Med. Sci., 1931, clxxxii., 170.
6. Baumgartner, E. A.: Folia Hæmatol., 1930, xliii., 192.
7. Becker, G.: Acta Med. Scandinav., 1930, supp. xxxiv., 70, and 1931, lxxv., 227.
8. Beebe, R. T., and Lewis, G. E.: Amer. Jour. Med. Sci., 1931, clxxxi., 796.
9. Boenheim, F.: Archiv f. Verdauungskrankh., 1920, xxvi., 74.
10. Carlson, A. J.: Physiol. Rev., 1923, iii., 1.
11. Castle, W. B., et al.: Amer. Jour. Med. Sci., 1929, clxxviii., 748 and 764; 1930, clxxx., 305; 1931, clxxxii., 741.
12. Connery, J. E., and Joliffe, N.: Ibid., 1931, clxxxi., 830.
13. Davidson, S.: THE LANCET, 1931, ii., 1395.
14. Davies, D. T.: Quart. Jour. Med., 1931, xxiv., 447.
15. Denton, J.: Amer. Jour. Trop. Med., 1925, v., 173.
16. Doan, C. A., Cunningham, R. S., and Sabin, F. R.: Contributions to Embryology, Carnegie Institute of Washington, 1925, xvi., 163.
17. Esser: Deut. Archiv. f. Klin. Med., 1907, lxxxix., 576.
18. Fairley, N. H., and Kilner, T. P.: THE LANCET, 1931, ii., 1335.
19. Fairley, Mackie, F. P., and Billimoria, H. S.: Indian Jour. Med. Research, 1928, xvi., 831.
20. Fanconi, G.: Der intestinale Infantilismus, Berlin, 1928.
21. Gunby, P. C.: Northwest Med., 1928, xxvii., 287; ref. Jour. Amer. Med. Assoc., 1928, xci., 355.
22. Hampson, A. C., and Shackle, J. W.: Guy's Hosp. Rep., 1924, lxxiv., 193.
23. Hansen, I.: Ugeskrift f. Laeger, 1922, lxxxiv., 1643; ref. Jour. Amer. Med. Assoc., 1923, lxxx., 220.
24. Hartfall and Witts, in publication.
25. Hegler, C.: Deut. med. Woch., 1928, liv., 1505.
26. Holler, G., and Kudelka, O.: Folia Hæmatol., 1927 xxxv., 97.
27. Holst, J. E.: Acta Med. Scandinav., 1927, lxvi., 74.
28. Hoskin, T. J., and Ceiriog-Cadle, E.: THE LANCET, 1927, i., 433.
29. Hunter, D.: Ibid., 1930, i., 999.
30. Hurst, A. F.: Quart. Jour. Med., 1932, i., 157.
31. Ivy, A. C., Morgan, J. E., and Farrell, J. I.: Surg., Gyn., and Obst., 1931, liii., 611.
32. Keefer, C. S.: Ann. Int. Med., 1931, v., 740.
33. Keefer, Huang K. K., and Yang, C. S.: Jour. Clin. Invest., 1930, ix., 533.
34. Kern, R. A.: Ann. Int. Med., 1931, v., 729.
35. Jackson, A. S.: Jour. Amer. Med. Assoc., 1931, xcvii., 1954.
36. Krjukoff, A.: Folia Hæmatol., 1927, xxxv., 329; and 1931, xlv., 196.
37. Little, W. D., Zerfas, L. G., and Trusler, H. M.: Jour. Amer. Med. Assoc., 1929, xciii., 1290.
38. Lyon, E. C.: Ibid., 1929, xcii., 11.
39. Mackay, H. M. M.: Nutritional Anæmia in Infancy, Medical Research Council Special Reports No. 157, London, 1931.
40. McLester, J. S.: Jour. Amer. Med. Assoc., 1930, xcv., 719.
41. Means, J. H., Lerman, J., and Castle, W. B.: New Eng. Jour. Med., 1931, cciv., 243.
42. Mettier, S. R., Minot, G. R., and Townsend, W. C.: Jour. Amer. Med. Assoc., 1930, xcv., 1089.
43. Meulengracht, E.: Acta Med. Scandinav., 1929, lxxii., 231.
44. Idem.: Ugeskrift. f. Laeger, 1929, xci., 103; ref. Folia Hæmatol., 1930, xl., 513.
45. Mills, E. S.: Canad. Med. Assoc. Jour., 1931, xxv., 75.
46. Minot, Murphy, W. P., and Stetson, S. P.: Amer. Jour. Med. Sci., 1928, clxxv., 581.
47. Munford, S. A.: Clifton Med. Bull., 1925, ii., 139.
48. Nalr, T. W.: West Virginian Med. Jour., 1929, xxv., 557.
49. Poynton, F. J., and Macgregor, J. V.: THE LANCET, 1930, ii., 240.
50. Reimann, F.: Med. Klinik, 1931, xxvii., 880.
51. Reinhold, J.: Ibid., 1929, ii., 1097.
52. Ryle, J. A.: Guy's Hosp. Reps., 1924, lxxiv., 1.
53. Saltzman, F.: Finska Läkaresälls-kapets Handlingar, 1928, lxx., 1127.
54. Schermann, S. I.: Folia Hæmatol., 1930, xli., 445.
55. Seppänen, A.: Acta Med. Scandinav., 1930, supp. xxxiv., 127.
56. Seyderhelm, R.: Ergeb. d. inn. Med. u. Kinderheilk., 1922, xxi., 361.
57. Seyderhelm, Lehmann, W., and Wichels, P.: Klin. Woch., 1924, iii., 1439.
58. Shima, K.: Beiträge z. Klin. Chirurg., 1931, cliii., 275.
59. Simpson, C. K.: Guy's Hosp. Reps., 1931, lxxxi., 392.
60. Smith, C. T.: Surg., Gyn., and Obst., 1925, xl., 223.
61. Smith, and Kinlaw W. B.: Ann. Int. Med., 1931, iv., 939.
62. Stone, C. T.: Ibid., 1928, ii., 215.
63. Taylor, G. W.: New Eng. Jour. Med., 1930, ccii., 269.
64. Thaysen, T. E. H.: Acta Med. Scandinav., 1926, lxiv., 292.
65. Turner, R. H.: Jour. Clin. Invest., 1931, x., 61.
66. Uhlhorn, E.: Archiv f. Klin. Chirurg., 1927, cxliv., 593.
67. Umber, in Mohr and Sta helin's Handbuch der Inneren Medizin, Berlin, 1918, iii., 164.
68. Ungley, C. C.: THE LANCET, Jan. 30th, 1932, p. 227.
69. Wahlberg, J.: Acta Med. Scandinav., 1929, lxxii., 143.
70. Walko, K.: Archiv f. Verdauungskrankh., 1907, xiii., 497.
71. Wills, L.: Brit. Med. Jour., 1931, i., 1059.
72. Witts, L. J.: Ibid., 1931, ii., 883.
73. Wood, E. J.: Amer. Jour. Med. Sci., 1925, clxix., 28.

THE TREATMENT OF DIABETIC URÆMIA WITH HYPERTONIC GLUCOSE SOLUTIONS.

BY H. W. FULLERTON, M.B. ABERD.,
HOUSE PHYSICIAN ABERDEEN ROYAL INFIRMARY;
A. LYALL, M.D. ABERD., M.R.C.P. LOND.,
LECTURER IN CLINICAL CHEMISTRY IN THE UNIVERSITY OF ABERDEEN:
AND
L. S. P. DAVIDSON, B.A. CAMB., M.D., F.R.C.P. EDIN.,
REGIUS PROFESSOR OF MEDICINE IN THE UNIVERSITY.

THE case reported below was admitted to the Aberdeen Royal Infirmary in diabetic coma, and passed into uræmia and anuria, eventually making a complete recovery. The extreme rarity of recovery under these conditions appears to warrant the publication of an individual case.

Case Record.

Miss A., aged 27, was admitted to hospital on Oct. 26th, 1931, unconscious, with marked air hunger, exhaling acetone strongly, and with her urine loaded with sugar and acetone. The case was diagnosed as diabetic coma.

Previous history.—About May, 1929, the patient began to get easily tired, to be a little thirsty, and to notice that she was slightly thinner. Her family doctor found sugar in her urine, and accordingly sent her for investigation to the Royal Infirmary. Her fasting blood-sugar was 218 mg. per 100 c.cm. She was placed on a diet to which she strictly adhered, and in consequence enjoyed good health. At subsequent examinations the fasting blood-sugar was always in the neighbourhood of normal. In January, 1931, she developed an ischio-rectal abscess on the right side, which burst. Apart from local discomfort this infection produced no general manifestations.

Present illness.—About a week before admission the patient developed another ischio-rectal abscess on the same side. This was treated with hot fomentations. The day before admission the patient began to feel off colour and seedy, and next morning gradually passed into coma. On admission she was definitely, but not deeply, unconscious, since resistance to passive movement was present. Respiration was deep and sighing. There was a strong smell of acetone in her breath. The skin was cold and clammy. The tension of the eyeballs was greatly reduced. The pupils were moderately dilated, and reacted sluggishly to light. The blood pressure was 122/70, the pulse-rate 96, and the temperature 97·2° F.

General examination.—Nutrition good. Respiratory, alimentary, and cardiovascular systems satisfactory. Nervous system normal. Plantar reflexes were flexor. A large ischio-rectal abscess was found in the right side, and was immediately opened. Black material, which was a mixture of pus and fæces, was evacuated. Small blue areas on the pads of several toes, suggestive of early gangrene, were present.

Laboratory data on admission (11.25 a.m., Oct. 26th).—Urine, catheter specimen, amount 8 oz., clear amber colour, acid reaction, specific gravity 1032. Sugar +++, 6·25 per cent. Acetone and diacetic acid +++. Albumin ++. Chlorides diminished. Microscopic examination of deposit: many granular casts, scanty hyaline casts, and epithelial cells. No erythrocytes or pus cells. Blood-sugar, 454 mg.; urea, 33 mg.; and chlorides, 613 mg. per 100 c.cm.

TREATMENT.

The patient was covered with warm blankets and surrounded with hot-water bottles. At 12 noon 50 units of insulin were injected subcutaneously. Within half an hour she partially regained consciousness, and 30 g. of glucose were given orally.

At 1 P.M. 40 units of insulin were given, and at 2 P.M. and 3 P.M. 30 g. of glucose. At 4 P.M. the blood-sugar was 486 mg. per cent., and the urine still contained considerable quantities of sugar and ketone bodies. Accordingly, 40 units of insulin were given, together with 30 g. of glucose. At 4.30 P.M. the patient sufficiently recovered consciousness to be able to answer questions. At 5 o'clock 30 g. of glucose were again given, with continued improvement in every way. The patient, at this stage, was taking plenty of fluid by mouth. At 8 P.M. another 40 units of insulin were given. At 10 P.M. the patient was sleeping comfortably, respiration still sighing, acetone in breath and diacetic acid in urine present, but much less marked.

At 12 P.M. a catheter was passed, and only one ounce of urine was found in the bladder. Sugar and acetone were present, but much less in amount, while only a trace of diacetic acid was found. Blood was withdrawn, and the result of the estimation done next morning showed that the blood-sugar was 382 mg. per cent. The blood-urea had risen to 55 mg. per cent., and the chlorides remained approximately stationary, at 627 mg. per cent. She was given 30 g. of glucose

Date.	Blood.			Urine.								Insulin (units).	Remarks.
	Sugar.	Urea.	Chlorides.	Amount (oz.).	Sugar.	Ketones.	Albumin.	Casts.	Blood.	Urea.	Chlorides.		
	mg. per cent.									mg. per cent.			
26/10/31: 11 A.M.	454	33	613	..	+	+	+	G.H.	—	780	130	190	Typical diabetic coma.
12 midnight	382	55	627	39½	Tr.	Tr.	..	..	..	..	..	..	Patient conscious.
27/10/31: 10 A.M.	323	..	598	3½	Tr.	Tr.	+	G.H.	+	700	30	130	3½ pints N. saline with 5 per cent. glucose intravenously. Vomiting started. Signs of ketosis gone. Anuria.
12 noon	177	110	..	..	..	..	..	..	..	..	..	..	
28/10/31	129	170	613	2½	Tr.	Tr.	+	G.H.	+	560	28	70	1 pint N. saline with 5 per cent. glucose. Clinical condition about the same.
29/10/31	117	206	..	1½	Tr.	Tr.	+	G.H.	+	..	..	100	2 pints N. saline with 5 per cent. glucose. Patient more alert.
30/10/31	454	220	..	2	0	0	+	G.H.	+	..	..	70	2 pints N. saline with 25 per cent. glucose. Urinary flow restarted.
31/10/31	450	230	..	20	+	0	Tr.	Sc.	0	760	220	70	1 pint N. saline with 25 per cent. glucose
2/11/31	460	221	510	52	+	0	0	Sc.	0	710	300	40	Patient quite comfortable.
3/11/31	412	173	438	55	+	0	0	Sc.	0	..	320	40	—
4/11/31	328	133	..	34	+	0	0	Sc.	0	..	..	40	Complaint of pain in right side.
5/11/31	472	105	..	30	+	0	Tr.	Sc.	0	..	..	40	—
6/11/31	408	70	438	22	+	0	Tr.	Sc.	0	..	..	40	—
9/11/31	308	25	..	..	Free	0	0	0	0	..	..	40	—
25/11/31	130	25	..	..	,,	0	0	0	0	..	..	40	—

Tr.=trace. G.H.=granular hyaline. Sc.=scanty.

and 20 units of insulin. During the first 12 hours the patient received 190 units of insulin and 150 g. of sugar. At 5 A.M. the bladder again contained only an ounce of urine, in which a trace of sugar and acetone was found, and no diacetic acid was present. Air-hunger was absent, so further insulin treatment was temporarily discontinued. At this time vomiting was first noticed. Dark bilious material was brought up, the act having no relation to food.

For the following four days the patient was practically anuric, since approximately two ounces of urine was all that could be obtained each 24 hours by repeated catheterisation.

During this period she lay in an extremely lethargic condition, but was able to understand simple questions. The temperature swung in an irregular manner between normal and 101° F. The blood pressure varied from 102 to 122 on different occasions, and the pulse-rate from 100 to 146. Although plenty of fluid was given by the mouth, the severe and continuous vomiting as quickly removed it, so that fluid was probably not absorbed by this route. Accordingly, approximately two pints of normal saline, containing 5 per cent. glucose, were given intravenously during each 24 hours, and about 30 units of insulin were injected subcutaneously three times a day. Numerous blood-sugar estimations during this period showed that the level varied from 120 to 300 mg. per cent., while the blood-urea steadily rose until on the fifth day after admission it reached 224 mg. per cent. The plasma chlorides were still practically stationary, at approximately 600 mg. per cent. The small amount of urine obtained boiled almost solid with albumin, and microscopic examination revealed large numbers of granular casts and red cells, signifying an acute toxic nephritis.

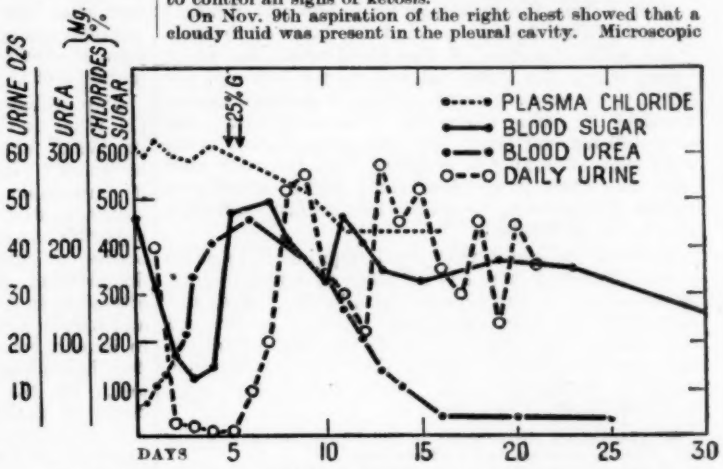


Chart showing effect of two injections of 25 per cent. glucose solution at points marked by arrows.

A résumé of the laboratory and clinical data is given in the accompanying table and chart.

THE USE OF HYPERTONIC INTRAVENOUS GLUCOSE.

A consideration of these facts led us to the conclusion that the condition of the patient had altered from diabetic coma to what might be described as diabetic uræmia. The position appeared to be critical, since in our experience patients with diabetic coma who develop a definite anuria, and in whom the blood-urea reaches 150 mg. per cent. or over, invariably die. The facts supporting this contention are appearing in a separate paper at an early date Simple remedies, such as hot fomentations and cupping the loins, had failed. Irritant diuretics appeared to be contra-indicated, as judged by the presence of blood and casts in the urine. As a last desperate resort it was decided to try to restart urinary secretion by raising the blood-sugar level to a high degree with hypertonic intravenous glucose. The matter is discussed in detail at the end of this paper.

Accordingly, at 5 P.M., and again at 10 P.M., on Oct. 30th, one pint of a 25 per cent. glucose solution in normal saline was given intravenously. The solution was introduced very slowly, about 40 minutes being taken for the injection. At 12.30 A.M. 8 oz. of urine were passed; this contained some sugar but no diacetic acid. During the rest of that day 20 oz. were passed. At 7.30 P.M. on Oct. 31st another pint of 25 per cent. glucose in normal saline was given intravenously. On the following two days, 34 oz. and 52 oz. of urine were passed, and subsequently normal urinary secretion occurred. The blood-urea, which on the sixth day after admission had reached a maximum of 230 mg. per cent., steadily fell and returned to normal figures in nine days. The plasma chlorides, which up to this date had been somewhat above normal, fell to a figure slightly below normal.

No attempt was made to reduce the blood-sugar level to normal, since a definite danger from coma still existed, in view of the sepsis from the unhealed ischio-rectal abscess. The occurrence of a right-sided pleurisy with effusion, which started on Nov. 4th, was an additional reason for this policy. Adequate glucose and insulin were given daily to control all signs of ketosis.

On Nov. 9th aspiration of the right chest showed that a cloudy fluid was present in the pleural cavity. Microscopic examination revealed numerous polymorphs, but bacteriologically the fluid was sterile. During the subsequent four weeks the temperature gradually ceased to swing and returned to normal, where it has remained for the past month. The fluid has disappeared from the pleural cavity, some dulness at the base remains, and a few fine crepitations can be heard at the end of inspiration.

The urine is now normal in quantity, and the maximum concentration after the administration of 15 g. of urea is 2·3 per cent.; it is free of albumin, sugar, ketone bodies, casts, and cells. The ischio-rectal abscess is healed. The diet has been gradually increased to 1800 calories, with 20 units of insulin twice daily. The patient's nutrition is excellent, and a complete recovery may now be said to have been achieved.

Discussion.

A number of observers have noted the occurrence of uræmia as a sequel of diabetic coma.

Joslin [1] emphasises a fact, already well recognised, that renal changes frequently occur in diabetic coma, though oliguria, and especially anuria, are uncommon. Ambard and Merklen [2] published a case in which the blood-urea increased to 180 mg. per cent., while the plasma carbon dioxide, after having been low, returned to normal and the patient died with nephritis. Merklen, Wolf, and Bicart [3] described a case somewhat analogous to our own, in a young woman in whom hyperglycosuria and acidosis were overcome by insulin treatment, but the patient developed an acute and fatal nephritis, with oliguria, albuminuria, and uræmia. John [4] observed a condition very like the present case in a young man in whom the blood-urea increased to over 200 mg. per cent., and remained at this level for five days, with retention of urine. Renal function was re-established by intravenous injection of 500 c.cm. of 1·4 per cent. saline and 1 per cent. sodium carbonate, and recovery took place. Unfortunately no information with regard to the volume of urine secreted or the blood chloride is available.

Recovery from diabetic coma, however, is rare when anuria supervenes, and in our experience the condition is nearly always fatal. Apart from anuria itself there may be evidence of nitrogen retention of almost any degree in the blood. If the increase in blood-urea be taken as an index of the failure of renal function, it would appear that the chances of

recovery are low when this value is increased above 100 mg. per cent. In our own series of cases [5] we found that only one death occurred amongst 13 patients with diabetic coma where the blood-urea did not exceed 100 mg. per cent., but that four out of a total of six patients died where the blood-urea was above that figure. Combining the 31 cases collected from the literature by Labbé and Boulin [6] with our own figures, we find 56 cases of diabetic coma with elevation of the blood-urea. In 34 of these, where the value did not exceed 100 mg. per cent., there were six deaths, while 14 deaths occurred amongst 22 cases where the blood-urea value was over 100 mg. per cent. But the present case, along with that of John,[4] is evidence that recovery may still take place even when much higher blood-urea values are present, provided the urinary secretion can be re-established.

There is no doubt that renal function is to some extent disturbed in nearly all cases of diabetic coma, as evidenced by the presence of albumin, casts, and sometimes blood in the urine. Several factors are concerned in this type of renal failure, and a study of the literature would suggest that their importance varies in individual cases. These factors can, however, be classified as follows:—

(*a*) Circulatory disturbance in the kidney accompanying fall of blood pressure and cardiac failure.
(*b*) Dehydration of the blood-plasma due to lack of intake of fluid, previous polyuria, and often to vomiting (Bulger and Peters [7]).
(*c*) Increased endogenous nitrogen metabolism (Lyall [8]).
(*d*) Actual pathological change in the renal parenchyma, due to the excessive excretion of ketonic acids and salts and other metabolites in the early stages of the coma (Snapper [9]).

The increase in blood-urea is probably not wholly an index of the failure of renal function, since concentration of the chemical constituents of the plasma, including urea, is brought about by dehydration, as has been shown by Bulger and Peters.[7] Increased endogenous nitrogen metabolism also tends to cause an increase in the blood-urea, but in the later stages, when oliguria or anuria has supervened, the great increase in the blood-urea is almost certainly due to direct retention.

Blum, Grabar, and van Caulaert [10] have adduced evidence for the interesting suggestion that the azotæmia in diabetic coma is due not to a partial anuria, to renal changes or to the acidosis itself, but to the loss of salt from the blood and tissues. If this hypothesis were substantiated it would bring the azotæmia of this type into line with that which accompanies salt loss in conditions like upper intestinal obstruction, pyloric stenosis, and intense diarrhœa. These authors cited two cases of diabetic coma where the blood chlorine decreased to 284 mg. per cent., and the urea reached 480 mg. per cent. upon a chlorine-free régime. The blood-urea values rapidly returned to normal after administration of sodium chloride by mouth. But they failed to repeat these observations in other cases of diabetic coma, even in one of the same individuals in a later attack of coma. It should be remarked that both of the cases in which they originally observed the decrease in chlorides suffered from severe diarrhœa of 15 days' and 10 days' duration respectively—a condition in itself likely to cause hypochloræmia. In our own case the plasma chlorides remained high during the period of anuria, and did not commence to fall until the urinary flow restarted. In further observations of our own we have never found the plasma chloride low in diabetic coma, and in this we are supported by the careful researches of Bulger and Peters,[7] who in an investigation of the phenomena of dehydration in diabetic coma found the plasma chlorides to be either increased or normal. They usually observed that a marked increase occurred in the excretion of chloride during improvement, as also occurred in our own case. The kidney normally excretes chloride in abundance when the plasma chloride is above 520 mg. per cent. The fact that the urine of our patient contained only minimal traces of chloride, while the plasma chlorides were over 600 mg. per cent., is ample evidence of the inability of the kidney to excrete this substance.

Two problems are of particular interest in this case. (1) What is the cause of anuria in diabetic coma? (2) What factors influenced the renewal of urinary secretion? Information available at present makes it impossible to state categorically whether the anuria in diabetic coma is primarily the result of a nephritis caused by the excretion of irritating ketone bodies or whether the nephritis is secondary to dehydration, disturbances of osmotic equilibrium, and alteration in capillary circulation. The renal damage and anuria which occurs in high intestinal obstruction in human beings and in experimental obstruction in dogs is undoubtedly in some way associated with salt loss. We can definitely say that this was not the cause of anuria in the present case, and we are inclined towards the opinion that the anuria was the sequel of a parenchymal change in the kidney due to temporary toxic causes. The renewal of urinary secretion in this case followed the intravenous administration of hypertonic glucose.

A similar procedure has been found effective in children dehydrated by prolonged diarrhœa, as reported by Hoag and Marples,[11] who used 10 per cent. glucose intravenously. Similarly, Comfort and Snell [12] used 20 per cent. intravenous glucose to stimulate renal secretion in patients with anasarca secondary to cirrhosis of the liver. The mechanism causing the renewal of the urinary flow in the case reported by John does not appear to be the same as in the present instance, since the solution given was only slightly hypertonic, and in our case several previous intravenous injections of normal saline with 5 per cent. glucose had proved ineffective.

It is recognised that the kidney has a vital capacity for the secretion of certain substances when these are present in the blood stream above the threshold level. Sugar and chlorides were already present in concentration much above that level, and there was also a marked retention of urea. Raising the blood-sugar level still higher by the intravenous injection of hypertonic glucose does not appear to be a satisfactory explanation in itself for the subsequent diuresis. It appears more probable that the renewed urinary excretion was due to a disturbance of osmotic equilibrium. Although clinically no evidence of œdema was recognised, experimental work on depancreatised dogs shows that tissue œdema may occur in the absence of gross clinical signs of its presence. Migration of fluid back into the capillary channels might occur by a sudden disturbance of osmotic equilibrium such as would be caused by the introduction of five times isotonic glucose solution. A gradual change, on the other hand, might not accomplish this, since it would only result in equilibrium being re-established at a new level. The result of a change in osmotic pressure would be an increased blood volume, improvement in the general circulation, better oxygenation of the blood, and increased blood flow through the kidney. These factors, in our opinion, may be the explanation of the renewed renal activity.

(*References at foot of opposite page.*)

SPECIFICITY OF THE "PROTEOSE" INTRADERMAL REACTIONS.

By John Freeman, M.D. Oxf.,

LECTURER IN BACTERIOLOGY AND DIRECTOR OF THE DEPARTMENT OF CLINICAL BACTERIOLOGY, ST. MARY'S HOSPITAL, LONDON.

Dr. G. H. Oriel obtained a white precipitate from urine which he called "proteose"; he claimed that when this is isolated from an asthmatic patient's urine and injected into him intradermally "a reaction results which is similar to that seen on the injection of an antigen to which the allergic patient is sensitised."[1]

This, if true, would be of the greatest importance: already an immunotherapy has been based on it, and practitioners are sending cases of asthma, eczema, &c., to me, and without doubt to others also, with the request "please treat with proteose." It does not matter to pathology that the allergic diseases, so amenable to suggestion, should be the happy hunting ground of the experimental therapist; but doubtful scientific theories should be tested, however uncongenial this work may be, or they may confuse further research. At the end of November last I gave my reasons for believing this basic fact of the specificity of the proteose to be wrong—or at least unproven.[2] Since that date attempts have been made on both sides at conversion, and I think that Oriel and his fellow-workers would no longer claim that the alleged specific reaction was "similar to," let us say, the pollen reaction in a hay-fever patient. But he still claims some specificity, as indeed he must if his theory is to stand on its feet and if his proteose therapy is to be scientifically justified. I therefore made more elaborate intradermal tests to confirm or remove my own doubts.

It will make things clearer if I explain at the beginning what I only learnt half-way through my investigations: proteose is not a chemical substance, but a more or less fortuitous collection of substances produced by the excretory activities of the kidneys. With Oriel's latest technique, as well as with his earlier and less precise methods, you get "proteose" from everyone's urine, but the iller the person the more you tend to get of it. Proteose is always toxic, as might be expected; if injected into any man's skin, and if taken from any source—well or ill, allergic or non-allergic—you get in a few minutes a slightly raised wheal of varying size, and sometimes an erythematous flush round it, both wheal and flush fading in a few minutes more. The alleged specific reaction of proteose from an asthma patient on that patient's own skin is therefore not a question of positive and negative (as I first thought, and as it is with, say, grass pollen on the skin of hay-fever and non-hay-fever persons), but a question of slightly less or slightly more than one gets in the control cases—which are amongst themselves varying very considerably. Add to this the tendency to dermographia to which allergic cases are peculiarly prone, and it will be clear that for any critical opinion great caution must be taken in arranging the experiment.

[1] Proc. Roy. Soc. Med., Sec. Derm., 1931, xxiv., 55.
[2] THE LANCET, 1931, ii., 1212, 1322; Brit. Med. Jour., 1931, ii.

(*Continued from previous page.*)

PROF. DAVIDSON AND OTHERS: REFERENCES.

1. Joslin, E. P.: Treatment of Diabetes Mellitus, Philadelphia, 1928, p. 656.
2. Ambard, L., and Merklen, P.: Bull. et mém. Soc. méd. Hôp. de Paris, 1925, p. 547.
3. Merklen, P., Wolf, M., and Bicart P.: Ibid., 1926., l., 359.
4. John, H. J.: Jour. Amer. Med. Assoc., 1925, lxxxiv., 1400.
5. Anderson, A. G., and Lyall, A. (under publication).
6. Labbé, M., and Boulin, R.: Ann. de Méd., 1931, xxix., 386.
7. Bulger, H. A., and Peters, J. P.: Arch. Int. Med., 1925, xxxvi., 857.
8. Lyall, A.: Quart. Jour. Med., 1927, xx., 115.
9. Snapper, I.: Proc. Roy. Soc. Med., 1927–28, xxi., 1771.
10. Blum, L., Grabar, P., and van Caulaert, C.: Ann. de Méd., 1929, xxv., 23.
11. Hoag, L. A., and Marples, E.: Amer. Jour. Dis. Child., 1931, xlii., 291.
12. Comfort, M. W., and Snell, A. M.: Med. Clin. N. Amer., 1931, xv., 107.

THE HAY-FEVER "PROTEOSE."

In Fig. 1 the well-recognised reactions of pollen on the skins of hay-fever and of normal subjects (Columns I. and III.) are contrasted with the alleged hay-fever proteose reactions on neighbouring areas of skin on the same subjects (Columns II. and IV.). The pollen extract (poll.) was from my usual supply; the tests were made by placing drops of normal saline and of 10,000 unit pollen extract on neighbouring portions of skin, and then pricking through these drops with clean needles to the depth of perhaps a millimetre—i.e., till the person tested just experienced a faint prick; that is my usual technique for the diagnostic pollen reaction for hay-fever. The hay-fever proteose (H.F.P.), doubtless isolated from the urine of some hay-fever patient, was given me for testing by Oriel himself, together with his "control proteose" (C.P.)—i.e., a proteose isolated from a non-hay-fever subject. After a few tests I added normal saline as a second control. The tests of the proteose and its controls were made by intradermal injections of one-twentieth of a cubic centimetre of each of the fluids into neighbouring areas of skin—the method employed by Oriel and his fellow-workers. All these tests—the two pricks and the three intradermal injections—were made on three groups of persons: (1) the hay-fever subjects; (2) normal—i.e., non-allergic—subjects; and (3) allergic, but non-hay-fever subjects. All were taken as they came to hand and were not in any way selected, and all reactions have been traced off on glass and recorded without exception as they occurred.

It should be clearly understood that we cannot fairly compare the extent and the intensity of the reactions shown in Column I.—i.e., the pollen reactions—with the reactions in Columns II. and IV., because the prick through the drop of pollen extract into the skin can inject only a tiny fraction, say a fiftieth part, of the minim or so of fluid which was injected when testing the proteoses in Columns II. and IV. In spite of this the pollen reactions were as a rule more intense than the proteose reactions; the wheals were more raised, the flushes were more red, and both of them were longer lasting than the proteose reactions; after consideration no attempt has been made to indicate this in Fig. 1.

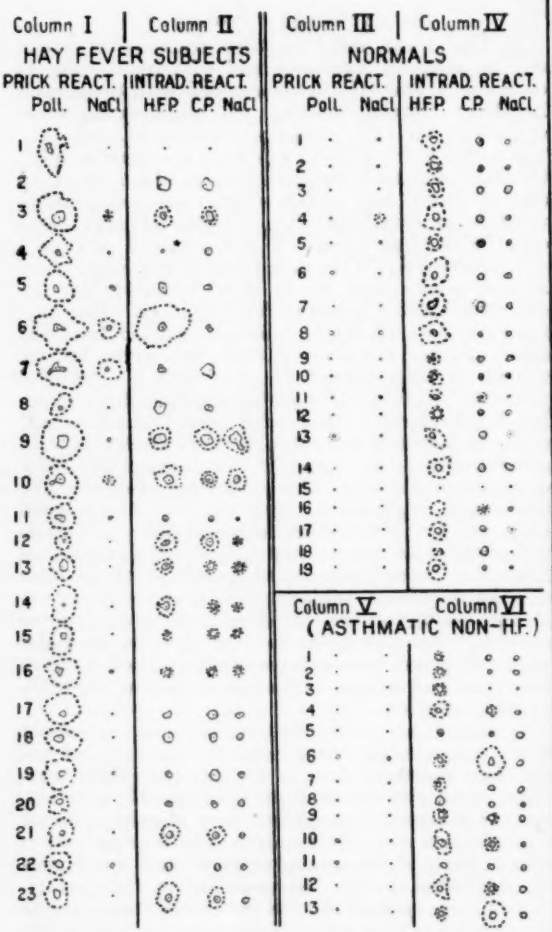
In all the reactions in Fig. 1 the central dot (where shown) indicates the point of entry of the needle; the unbroken ring shows the maximum extent of the wheal—usually in about 10 minutes; the broken ring shows the extent of the erythematous flush.[3] All the reactions were, as a rule, fading rapidly in 20 minutes, but, as has been said, the pollen reactions tended to last somewhat longer, besides being more intense.

I think we can say at a glance that Columns I. and III. in Fig. 1 show definite positive and negative

[3] The hay-fever proteose of No. 4 in Column II., which is marked with a star, went too deep into the skin and so got lost.

reactions respectively; for indeed the pollen reaction for hay-fever is about as reliable as the Wassermann reaction for syphilis. Columns II. and IV. should also show positive and negative reactions according to Oriel's story; they do not. One might perhaps have said that No. 6 in Column II. looks like a positive reaction, but it is discounted by the fact that the same subject shows in Column I. a "positive" reaction resulting from a prick through normal saline—i.e., this patient is dermographic. The proteose

FIG. 1.



reactions in Column IV. should all be negative according to Oriel's story (and according to mine, for that matter), but perversely enough many of them look like being positive [4] as shown in the figure, though their minor intensity, as compared with the true reactions from pollen in Column I., would probably render them dubious to anyone actually observing them.

THE ASTHMA-ECZEMA "PROTEOSE."

The intradermal reactions shown in Fig. 2 were all arranged after the controversial letters in *The Lancet* and *British Medical Journal*, and after I had seen at Guy's Hospital what very small differences were being taken to indicate a reaction, and the apparent lack of caution with which these possibly chance differences were being interpreted. In this intradermal technique (as in any other that I know of) it is possible to influence the result quite unconsciously to some slight extent, though I do not think that any clear-cut test like the pollen-hay-fever reaction could be obscured by this. The possibilities of error are these: (1) neighbouring areas of skin do not give quite the same reactions, the differences depending presumably on blood and nerve-supply [5]; (2) it is only normal human nature to see to it that the full one-twentieth of a cubic centimetre is injected of the fluid which according to theory ought to react, and to see to it that no excessive amount is injected of that which should not react; (3) apart from the mere amount of fluid we must consider the force and rapidity with which it is injected; (4) above all, the depth of injection into the skin makes a difference, for if given deep the reaction is lost or obscured, if very superficial the reaction is much more apparent.

It is possible, I think, to avoid all these sources of unconscious error if the injector does not know which fluid he is injecting or in what order he will be giving them. In Fig. 2 six different set of fluids had to be injected into the skin of each person tested; each fluid had its own particular syringe, and for each person the six syringes were shuffled till the injector did not know which was which till he looked afterwards at the inconspicuous identification marks. Thus a favourable or unfavourable site could not be chosen unconsciously.

Five proteoses were used, and to them was added normal saline solution to make the sixth fluid. Of these five proteoses three were from pronouncedly allergic cases—two (O and J) were asthma-eczemas, and one (P) was a bad case of asthma; the other two proteoses were from normal persons—one (N) from a rather nervous delicate young man, and the other (F) from a more robust but more elderly individual. These five proteoses were all extracted by my colleague, Dr. Roche Lynch, on published and unpublished instructions from Oriel, and after a personal visit which Oriel kindly made to Roche Lynch's laboratory. The five proteoses were made and used during the space of a few weeks only.

The control subjects were taken as they came to hand and without discrimination between them. In all three columns the reactions were traced off on glass, and all recorded in the figure as they occurred. The central dot again indicates the point of entry of the injecting needle; round this, however, there are here usually two unbroken rings. The inner one (marked with the thinner line) indicates the "peau d'orange" created by the injection itself, which was traced off on to glass immediately after the injection. [6] The outer and thicker unbroken ring shows the greatest extent of the whealing, usually in seven to ten minutes. Where this second ring does not occur in the figure

[4] This is probably due to the hay-fever proteose becoming more toxic with the passage of time; whereas Columns I. and II. were tested soon after receiving the proteose from Oriel, Columns III. and IV. were tested some four months later by which time the hay-fever proteose had become decidedly milky and, as this figure suggests, presumably more toxic though still sterile.

[5] In Fig. 1 an attempt was made to guard against this error by deliberately injecting the fluids in a different order in successive subjects. Thus for the first case the order of injections from above downwards might be hay-fever proteose, normal saline, and control proteose; for the next this might change to control proteose, hay-fever proteose, and normal saline; and so on. Thus each rival fluid would get the better station in turn.

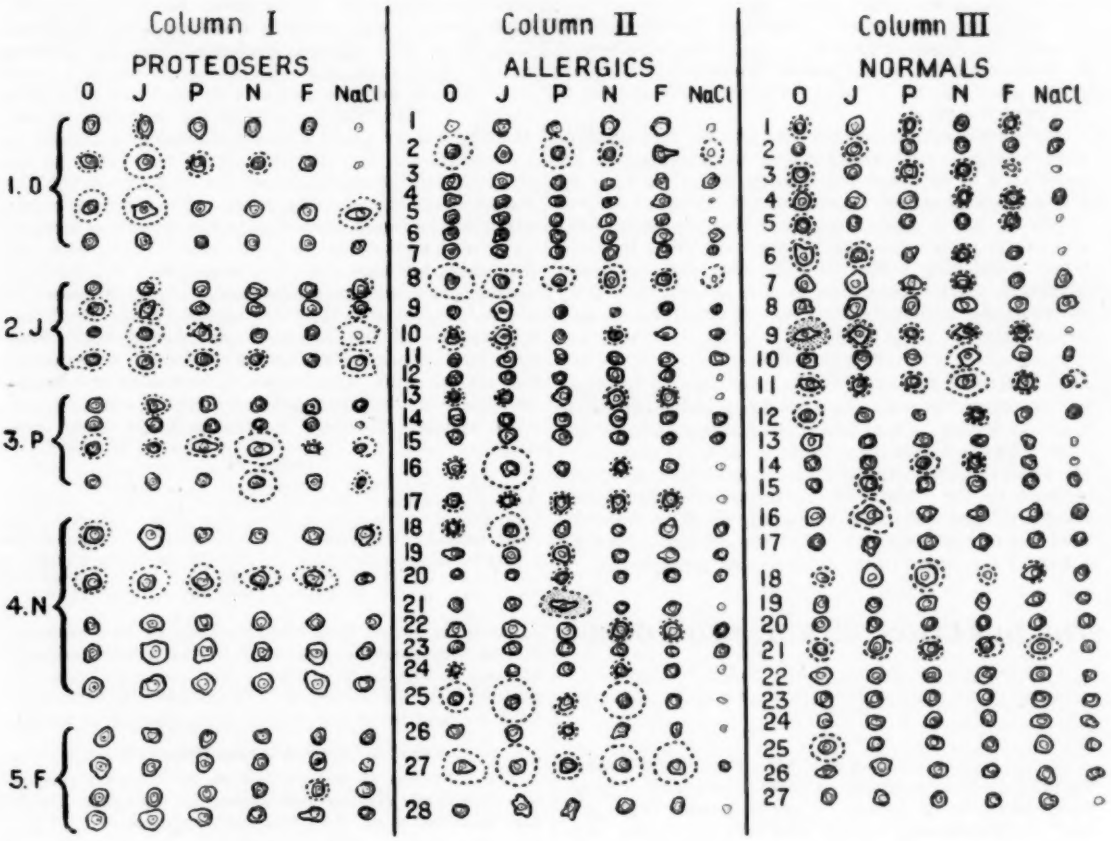
[6] I do not think this helps us very much for even the normal saline in most of the subjects tends to spread during the first ten minutes or so (see the "NaCl" reactions in all three columns), but I recorded this because I found that my colleagues at Guy's Hospital were doing so. It enables one to see to some extent how comparable were the mechanics of the various injections beside being able to say if there is any increase of wheal beyond the first swelling of the skin caused by the injection itself.

this signifies that the wheal never grew larger than the original "peau d'orange"; this will be found only with the salt controls, for none of the proteoses failed to grow larger. The broken line, where it occurs, signifies, as in Fig. 1, the outer limit of the surrounding erythematous flush. As with the proteose reactions in Fig. 1, the whealing and flushing was usually slight as compared with authentic positive skin reactions.

Column I. of Fig. 2 has been headed "Proteosers," and shows all the tests done on the five persons who yielded the five proteoses. They are indicated in the left margin by their already mentioned initial letters O, J, P, N, and F; and the proteoses obtained from these people are indicated at the head of each of the three columns by the same five initial letters, with the addition of "NaCl" signifying the normal saline control. It will be seen that the individuals O, J, P, and F were each of them tested four times over with each of the six fluids, while N was tested five times. The tests were made at different times of day and night, sometimes with three or four days in between; also, since the repetitions gave me opportunity of varying the areas, some were done on the usual sites of forearm or above the knee, while other tests were done on the calf of the leg, or across the chest, stomach, or shoulders. The more erythematous records—e.g., the second series on N—were obtained from stomach or chest. All this was done to eliminate the time and locality factors brought forward by Dr. Barber in his letter in THE LANCET of Dec. 5th, 1931, answering mine of the week before.[1] In Columns II. and III. the men were tested on the forearm, and the women and children on the anterior surface of the thigh.

If Oriel's story is correct then Miss "O" should react four times to O proteose, Master "J" should react to J proteose, and Mr. "P" to P proteose. All other skin tests in this figure, whether proteosers, allergics, or normals, should be negative save where an allergic person in Column II. happens to share the same allergic antigen with Messrs. "O," "J," or "P."

FIG. 2.



I think that anyone examining Fig. 2 carefully will find it impossible to detect any such specific reactions on the part of O, J, and P to their autogenous proteoses. I think there can be no failure to detect that so far as reactions can be said to occur they occur with everybody to all proteoses—in other words, that the proteoses are toxic.

Of the wellnigh 500 "reactions" shown in Fig. 2 there was only one which seemed to me to be quite of the pollen-hay-fever intensity, and this was allergic No. 21 to P proteose; possibly also normal No. 9's reactions to O and J proteoses might be placed in the same category. These three reactions have

[1] I believe this time variant, when it occurs, to be largely due to the psychological factor in the man under observation, but it is perhaps worth controlling when trying to detect minute differences of reaction.

been distinguished in the figure by shading-in the erythematous area, but the three urticarial wheals (especially that of allergic No. 21) were also more intense than with the other so-called reactions in the figure. I cannot tell the significance of this.

Many of the reaction sites of people in all three columns swelled up again in from 12 hours to three days after the injection, becoming red, swollen, and painful. All these delayed reactions disappeared again after about the length of time which it had taken them to show up. This did not occur more with the proteosers than with the allergics and normals, and there was no indication of specific delayed reactions of the proteosers to their autogenous proteoses. To avoid confusion, these reactions are not indicated in the figure; they were not the criterion selected by Oriel in his claim of specificity, and they were not all of them recorded in my notes. Presumably they are more akin to the Pirquet tubercle reactions or to the Schick test, &c.

In corroboration of my failure to find specific skin reactions with the autogenous proteoses, I am permitted to say that Dr. George Bray, working for the Asthma Research Council at Great Ormond-street Hospital, has obtained results which, he says, tally so exactly with mine that he does not think it worth while publishing them. I may also perhaps direct attention to the researches on the alleged specificity of proteose reported by Prof. Murray Lyon and co-workers.[8]

CONCLUSIONS.

1. Oriel's "proteoses," no matter whence obtained or on whom tested, show a fairly constant toxic reaction within a few minutes of injection into the skin. (They may also show a delayed reaction.) (2) I can detect no trace of the specific skin reactions claimed by Dr. Oriel. (3) An immunotherapy based on this alleged specificity has to my mind no scientific foundation. (4) Negative researches are dreary work; I hope I am now taking my leave of proteose.

THE DURATION OF THE RED LOCHIA.

By Chassar Moir, M.D., F.R.C.S. Edin.,
REGISTRAR TO THE OBSTETRIC UNIT, UNIVERSITY COLLEGE HOSPITAL.

It is usually believed that the blood-stained vaginal discharge which follows a normal confinement lasts for a period of about seven days, and that the persistence of this discharge for more than ten days is an indication of an abnormality such as retained pieces of placenta, subinvolution, or retroversion of the uterus. The following extract from a standard text-book[9] is representative of the usual teaching:—

> "In the average case with the mother suckling the child the lochia remain bright red for three or four days, then become pinkish-brown for three or four days; at the end of eight, nine, or ten days they lose their colour and are represented by an almost transparent fluid. . . . The lochia may remain coloured for rather longer than usual in cases in which the mother does not suckle her child."

It has long seemed to me that the cases which obey this rule are far outnumbered by the exceptions, in which the coloured lochia persist for some weeks without any discoverable abnormality. In order to obtain more exact information on these matters I have made special note of the duration of the lochia and the condition of the uterus in 250 patients whom I have personally examined at the postnatal clinic of University College Hospital.

The great majority of patients who attend this clinic have been delivered in the hospital five or six weeks previously, and each patient, before discharge from hospital, has been examined, and any abnormality, such as retroversion of the uterus, corrected. It follows that the proportion of normal cases in the postnatal clinic is very high. This is particularly so because many patients known to be debilitated while in hospital are sent to a convalescent home, and may not report to the postnatal clinic for some months. Such cases have not been included.

In this investigation no attempt was made to distinguish between lochia rubra and lochia serosa; each patient was carefully questioned on the duration of a red vaginal discharge, and the answer noted. The amount of the discharge was not taken into account because patients vary so much in their ability to describe quantities in accurate terms. A daily red or reddish-brown discharge sufficient to necessitate the wearing of a diaper was taken as the criterion of the duration of the red lochia for the purpose of this investigation. In a great many cases it was found that during the last three or four days in hospital the patient ceased to have a red discharge, but that with the resumption of household duties this discharge reappeared. In such cases the short interval was ignored, and only the final disappearance of the coloured lochia was taken into account. Each examination included questioning the patient with regard to general health and breast feeding, after which a general physical examination, with special reference to the pelvic organs, was made.

TABLE I.

Total number of cases examined 250
Average duration of coloured lochia .. .. 24 days

Duration of red lochia.	Number and percentage.	Duration of red lochia.	Number and percentage.
Under 10 days..	35 (14)	22–28 days ..	63 (25)
11–14 „ ..	40 (16)	29–35 „ ..	50 (20)
15–21 „ ..	47 (19)	Over 35 „ ..	15 (6)

Table I. shows that the duration of the coloured lochia was variable, but that in the great majority of cases it was far in excess of the "normal" ten-day period. In 70 per cent. of patients it exceeded 14 days, and in 51 per cent. it exceeded three weeks.

FACTORS INFLUENCING DURATION.

The question at once arises as to the part played by abnormal uterine conditions in bringing about this persistence of blood-stained discharge.

Subinvolution.—The uterus five weeks after delivery is not fully involuted, and may be best described as being one and a half times the size of a normal parous uterus. With a little experience it is easy to recognise the usual size and to pick out those cases in which the uterus is bulkier than usual. Such cases numbered 34. Subinvolution when combined with retroversion was not included in this group.

TABLE II.

Subinvolution of the uterus (without retroversion)—
Number of cases 34
Average duration of coloured lochia .. 25·2 days

Duration of coloured lochia.	Number and percentage.	Duration of coloured lochia.	Number and percentage.
Under 10 days..	5 (14·7)	22–28 days ..	4 (11·7)
11–14 „ ..	6 (17·7)	29–35 „ ..	6 (17·7)
15–21 „ ..	9 (26·4)	Over 35 „ ..	4 (11·7)

It will be seen that, although there was an unusually long duration of coloured lochia in a few cases, the average duration for this group was not appreciably

[8] Brit. Med. Jour., Jan. 23rd, p. 136.
[9] Midwifery. By Ten Teachers. London, 1931 (4th ed.), p. 525.

different from that of the normal group. In many cases the duration was unusually short; hence it may be assumed that subinvolution by itself is not a cause of a prolongation of coloured lochia.

Retroversion of the Uterus.—These cases are few, because retroversion is corrected before the patient leaves hospital, and pessaries are used to maintain the correct position in the first few months of the puerperium. Not infrequently retroversion is found to be associated with subinvolution. Such cases are included under the heading of retroversion.

TABLE III.

Retroversion of the uterus (with or without associated subinvolution)—
Number of cases 25
Average duration of coloured lochia .. 21·6 days

Duration of coloured lochia.	Number and percentage.	Duration of coloured lochia.	Number and percentage.
Under 10 days ..	8 (32)	22–28 days ..	6 (24)
11–14 „ ..	1 (4)	29–35 „ ..	4 (16)
15–21 „ ..	5 (20)	Over 35 „ ..	1 (4)

The cases of retroversion recorded in this table show an average duration of coloured lochia which is slightly less than that of the total group (21·6 days and 24 days).

Effect of Suckling.—It is frequently stated that suckling promotes the involution of the uterus, and conversely that the uterus of a woman who does not suckle her child involutes at a slow rate. The great majority of hospital patients nurse their babies, and so only 29 cases were recorded where no suckling had taken place. These were mostly women whose children had been born dead or had died soon after birth.

Table IV. shows that in the 29 recorded cases some degree of subinvolution was present in four cases. There was no undue prolongation of the coloured lochia in this group; the average duration was actually slightly less than that of the total number of cases (20·8 days, and 24 days).

TABLE IV.

Total number of women who did not suckle .. 29
Number found to have subinvolution of uterus .. 4
Average duration of coloured lochia .. .. 20·8 days

Duration of coloured lochia.	Number and percentage.	Duration of coloured lochia.	Number and percentage.
Under 10 days ..	7 (24)	22–28 days ..	9 (30·9)
11–14 „ ..	3 (10·3)	29–35 „ ..	4 (13·5)
15–21 „ ..	6 (20·6)	Over 35 „ ..	—

Parity and Age.—The cases were further divided into groups to show the effect of parity, and of age, in determining the duration of the lochia.

Primiparous patients 170
Average duration of coloured lochia .. .. 23·5 days

Multiparous patients 80
Average duration of coloured lochia .. .. 25·5 days

Age.	Number.	Average duration of coloured lochia.
25 years and under ..	117	24 days
26–35 years	103	24·5 „
35 and over	31	23·8 „

Thus, neither parity nor age has any appreciable effect in altering the duration of the coloured lochia.

CONCLUSIONS.

1. The duration of a coloured vaginal discharge following childbirth in 250 hospital patients varied considerably, but in the great majority of cases it far exceeded the supposed normal time limit. The average duration was 24 days. 2. The average duration of the coloured lochia in cases of uterine subinvolution and of retroversion was not greater than the average of the total number of cases. 3. In this series there were 29 cases in which suckling was not carried out. Those cases did not show any prolongation of the coloured lochia. 4. Age and parity had no appreciable effect on the duration of the coloured lochia.

CLINICAL AND LABORATORY NOTES

A CASE OF APPARENT URINARY MYIASIS.

BY J. GORDON, M.D. LEEDS, D.P.H.,
LECTURER IN BACTERIOLOGY, UNIVERSITY OF LEEDS;
AND
G. ROSEMONT, M.B., B.SC. LEEDS.

CASES of urinary myiasis are rare, and in those that have been reported the larva concerned is either that of the lesser house-fly, *Fannia canicularis*, or of the latrine fly, *F. scalaris*. At any rate in the text-books I have consulted there is no reference to the appearance of the larva of the common house-fly, *Musca domestica*, in the urinary tract. (Byam and Archibald: "The Practice of Medicine in the Tropics," 1921. Patton: "Insects, Mites, Ticks, and Venomous Animals of Medical and Veterinary Importance," 1929. Castellani and Chalmers: "Manual of Tropical Medicine," 1919.)

The patient was aged 50, male, and suffering from chronic parenchymatous nephritis. On passing urine into a chamber pot he felt a sudden sharp pain and observed that he had passed three larvæ. The following night (7 P.M.) he experienced the same pain on passing water and passed a single larva. On this occasion he reported it to his medical man. The larva was that of *M. domestica* in its final stage, and curiously transparent; the latter fact and the season of the year (December) in which the larva was passed suggested that it was not of accidental occurrence in the vessel. It is not known how larvæ gain access to the bladder in the male, but the suggestion has been made that it is by boring through into this position from the alimentary canal.

The larva was submitted to Prof. D. Keilin, F.R.S., who confirmed the diagnosis. We are indebted to Dr. Ll. Lloyd, reader in entomology, University of Leeds, for his assistance in the discussion of the case.

RECURRENT RUPTURED TUBAL GESTATION.

BY JOHN C. HODGSON, M.D. EDIN.,
HONORARY SURGEON TO ASHFORD HOSPITAL, KENT.

RECENT correspondence in these columns [1] prompts me to describe this case in the belief that the occurrence of ruptured tubal pregnancy twice within six months in the same woman may be worthy of record.

Mrs. A., a nervy woman, aged 32, with one child of 6 years, walked into the surgery on August 27th, 1931, complaining of severe pain in the right side, and scanty menstruation which was about a week

[1] THE LANCET, Jan. 16th, p. 132; Jan. 23rd, p. 209; Jan. 30th, p. 261; Feb. 6th, p. 315; Feb. 13th, p. 371.

overdue. On examination a tender pulsatile mass was found in the right fornix. At operation a ruptured tubal pregnancy was found in the ampullary portion of the right tube with some bleeding into the peritoneal cavity. The right tube was removed and she made an uninterrupted recovery.

On Feb. 8th, 1932, she again walked into the surgery, complaining of slight pain on the left side, and an excessive period with clots, which had gone on for over a week. She last had an ordinary period at Christmas time. Vaginal examination was done with difficulty because of the nervous state of the woman, and appeared negative. The uterus did not seem palpably enlarged, and while the cervix seemed a little soft it was not patulous. She was slightly anæmic, and was given some ergot and told to go home to bed, but to send if the pain returned. She did not send for 72 hours, when I found her semi-moribund lying in bed with all the signs of advanced internal hæmorrhage. She was hurried to the operating theatre, where the peritoneal cavity was found full of blood-clot, the uterus about the size of a tangerine orange, and a tubal mole extruding from a tear in the ampullary portion of the left tube. The left tube was removed, and on account of her critical condition gum saline was given intravenously at the end of the operation. She again made an uneventful recovery.

The left tube was sent to Maidstone pathological department, where they were unable to observe any abnormality to account for her condition.

I may say that Cullen's "umbilical sign" was not present on either occasion.

PERSISTENT ALLANTOIC DIVERTICULUM CAUSING INTESTINAL OBSTRUCTION.

By J. E. A. Boucaud, M.B. Lond.,
RESIDENT SURGEON, COLONIAL HOSPITAL, PORT OF SPAIN;
AND
J. A. Waterman, M.B. Glasg.,
GOVERNMENT MEDICAL OFFICER, TRINIDAD.

A MAN, aged 53, was admitted to the Colonial Hospital, Port of Spain, on Oct. 4th, 1931, at 7 P.M., with the history of having drunk some coconut water the previous evening, and of vomiting and abdominal pain since.

On admission.—Abdomen was soft with slight tenderness in the epigastrium. He had a left inguinal hernia, but there was neither incarceration nor strangulation. Per rectum nil. Temp., 99° F.; pulse-rate, 88; respirations, 28. He vomited several times during the night. Enema produced a constipated stool and some flatus.

On Oct. 5th, at 6 A.M., temp., 98·4°; pulse-rate, 58; respirations, 20. On examination at 9 A.M. nothing abnormal was noted in heart or lungs. The abdomen was slightly distended in the epigastric region. Liver dullness not reduced. He complained of slight discomfort in the region of the umbilicus. But he continued to vomit yellowish fluid. At 2 P.M. the general condition was good. An enema resulted in a small motion.

On Oct. 6th, at 6 A.M., temp., 97·8°; pulse-rate, 58; respirations, 20. He had vomited three times during the night. Vomitus at 5 A.M. had a definite fæcal odour. The epigastrium was still distended. Per rectum collapsed gut was palpated. The stomach was washed out and the fluid returned was definitely fæcal. Operation was advised but refused. Turpentine and ox-gall enemata were tried with little success. But his general condition remained very good until the evening of Oct. 8th. At 8 P.M. his vomitus was fæcal in character. The pain in his abdomen became more severe. At 10 P.M., temp., 97·6°; pulse-rate, 92; respirations, 28.

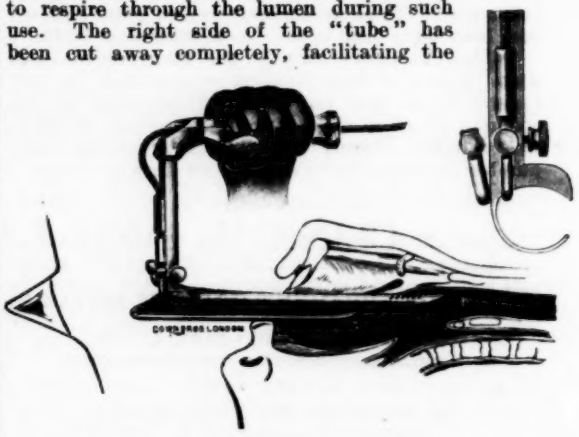
On Oct. 9th he consented to have the operation. Before the anæsthetic his stomach was washed out. A right paramedian incision was made. A portion of the small intestine, mesentery excluded, was caught in a circular opening in the wall of the bladder. This opening was due to an invaginated proximal end of a persistent allantoic duct. The intestine distal to this was quite collapsed, but as soon as the obstruction was relieved dilatation was effected. There was no gangrene. The site of pressure on the small intestine was not ulcerated, and the circulation was good. A Lembert suture was introduced to bury the line of constriction. The persistent allantoic diverticulum was evaginated and sutured to the peritoneum of the anterior abdominal wall, and the abdomen closed.

The patient made an uninterrupted recovery and was discharged well on Oct. 23rd.

NEW INVENTIONS

ILLUMINATED DIRECT LARYNGO-PHARYNGOSCOPE.

THE instrument here described I have been using for a considerable time; it is longer than the usual pattern and it has definite advantages. It is adequate for the largest adult; but owing to the tapering of the end, is convenient for children of two years old. For examination of or operation on the larynx it gives very good exposure, and the tip can be passed between the vocal cords; it is useful also as an upper œsophageal speculum, and will reach all foreign bodies in the common site of impaction, immediately below the cricoid, the slotting of the ventral surface near the tip enabling the patient to respire through the lumen during such use. The right side of the "tube" has been cut away completely, facilitating the



passage of instruments. An anæsthetic tube is built into the left wall, abolishing the need for a separate anæsthetic tube, and delivering the vapour well down the lumen. The "tube" of the instrument is of stainless steel, 20 cm. long, and 16 by 20 mm. internal diameter; the right wall is absent, a slot of 1 cm. wide being left. Commencing at 8 cm. from the tip the width is gradually tapered to 8 mm. at the tip, which is blunt; at the same time the ventral wall is discontinued, so that the distal 5 cm. is definitely a concave spatula, the concavity gradually lessening toward the tip. Illumination is by means of a Jackson-type lamp carrier, taking the standard lamps (2·5 milliamperes) which are carried at the distal end. The handle is also of the Jackson type, but hollow, so that the lamp-flex is carried well away from the upper end during use.

Messrs. Down Brothers, Ltd., St. Thomas's-street, London, S.E., are the makers of the instrument.

E. Watson-Williams, *M.C.*, F.R.C.S.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTION OF THE HISTORY OF MEDICINE.

AT a meeting of this section held on March 2nd, with Dr. R. O. MOON, the President, in the chair, a paper on the history of the

Introduction of Biochemistry into Medicine

was read by Dr. W. LANGDON BROWN. It was, he said, Paracelsus who was generally regarded as the father of physiological chemistry; for it was he who discarded Galenic tradition and taught chemical therapeutics. Additions to our knowledge of digestive processes and the discovery of carbon dioxide were made by Van Helmont, who, however, had laid greater store by his speculative doctrines than by these practical achievements. He was the founder of the iatrochemical school, which reached its zenith with Sylvius. Although ignorant of the fundamental facts of chemical science the iatrochemists had attempted in vain to explain the functions of the body entirely by reference to chemical operations. From them rose a school which attempted to explain all the phenomena of the body upon mechanical principles—the iatromathematical school, led by Borelli. Here was an example of the unwisdom of premature attempts to state medicine in terms of chemistry and physics. The danger was recurrent and there was to-day in certain quarters a tendency to push biochemistry to unjustifiable conclusions, indeed a new school of iatrochemistry. In the same way, although to settle down under the vitalistic hypotheses merely spelt obscurantism, the equation and the graph were so mentally satisfying, things "came out" so neatly that there was a distinct temptation to apply mathematics too soon to clinical work. The reaction from the iatrochemists had soon come with Stahl who stood forth at the close of the seventeenth century as the founder of animism, which doctrine had maintained itself in many minds through two succeeding centuries and existed still.

Dr. Langdon Brown then turned to the history of the introduction of certain biochemical methods and ideas into the diagnosis and treatment of disease. Although in 1777 Stevens had studied digestion of foodstuffs in perforated silver balls by inducing a stone swallower to swallow and regurgitate them, the first clear picture of gastric digestion had been given by Beaumont's observations on Alexis St. Martin in 1822. Two years later Prout had shown the presence of hydrochloric acid in the gastric juice. The gastric sound first employed by Leuke in 1883 and the test breakfast devised by Ewald had soon brought the recognition of the absence of hydrochloric acid in gastric carcinoma and its excess in peptic ulcer. But the introduction of the method of fractional test-meals had given an entirely new point of view, dynamic rather than static and therefore typically biochemical. Thus the importance of the bactericidal properties of hydrochloric acid had been learnt and the discovery made of achlorhydria in 4 to 6 per cent. of apparently healthy individuals. An achlorhydric diathesis had been established as a factor in what the speaker had called predestination in disease.

Pepsin was discovered by Brücke in 1851 and trypsin by Danilewski in the following year. Kühne had shown that the more profound disintegration of the protein molecule by the latter enzyme was responsible for the colour reaction with bromine water. Neumeister had given the name of tryptophan to this, merely implying that it was an indication of tryptic activity. There the matter had rested until 1901 when Hopkins and Cole had isolated tryptophan and had shown it to be an aromatic body and an important constituent of many proteins. This was the starting-point of the researches of the greatest practical value, for in 1906 by depriving rats of tryptophan in their diet Hopkins had shown that they failed to grow. From these experiments had come the recognition of the importance of the accessory food factors, resulting in the revolution of our conceptions and treatment of deficiency diseases. A by-product of the study of tryptic digestion had proved of far-reaching importance, for when these amino-acids had been identified they or their intermediate products were in certain circumstances found in the urine instead of their normal end-products. The occurrence of the abnormal excretion of such substances was usually congenital and familial. On this foundation Sir Archibald Garrod had built up his work on the inborn errors of metabolism. Such conditions as alkaptonuria, pentosuria, cystinuria, and porphyrinuria were admittedly rare and usually almost symptomless, but through them the conception of diatheses had been reinstated on a new and scientific basis on the lines of Mendelian inheritance.

It would be difficult, he said, to assess the value of biochemistry in our knowledge of nephritis, for while it had revealed the inadequacy of the classifications based on morbid anatomy it had not replaced these by any clear-cut conceptions. Richard Bright's description in 1827 of the disease associated with his name showed that he had appreciated the pre-renal factors in nephritis. Gradually those substances which the kidney failed to excrete had been found to be of greater importance than those which it allowed to escape. Methods for the quantitative estimation of urea in urine had been introduced by Ludwig, Doremus, and Dupré in 1853 and the following years. But for some time the results were misinterpreted because the amount of protein in the diet was not then known to influence the amount of urea in the urine. A clear idea of renal efficiency necessitated a comparison of the urea in the blood and the urine—a comparison first made by Widal and Javal in 1905. The recognition of urea retention in certain cases of nephritis and not in others had led to the distinction by the French school between hydræmic and azotæmic nephritis. But biochemistry to-day was chary of accepting the idea of a watery dilution of the blood volume. Rowntree and his co-workers in 1929 had shown that in glomerulo-nephritis and nephrosis the blood volume was within normal limits except that it might be slightly raised where there was accompanying anæmia. The induction of diuresis had no constant effect on blood volume; evidently the excess of fluid had to be drawn from the tissues.

The history of the biochemistry of lymph formation and œdema started in 1844 when Ludwig put forward a physical conception of urinary secretion, the blood pressure being the motive power for the filtration through the glomerular epithelium, while reabsorption occurred in the tubules. Heidenhain in 1866 had strongly opposed this view, regarding glomerular activity as a true secretion. When Ludwig discovered

that urea had a diuretic effect even after the blood pressure had been lowered by section of the spinal cord, he had come to regard glomerular activity as due to osmosis through a semipermeable membrane. These protagonists had been also engaged in a similar controversy over the allied subject of lymph formation. Ludwig had explained lymph formation by diffusion, but Heidenhain, having observed a friend afflicted by urticaria after eating crab, had described two classes of lymphogogues, one organic such as extract of crab's muscle and the other crystalloid substances; he had set up a secretory hypothesis of lymph formation. Then Starling in 1896 had overthrown this hypothesis by explaining Heidenhain's first class of lymphogogues as being toxic to the capillary endothelium while the second acted by osmosis.

Widal's theory of salt retention in the tissues as the cause of œdema had been advanced in 1902, but recent work put forward by Izod Bennett interpreted the salt retention as the result and not the cause of œdema. The most usually accepted explanation of renal dropsy to-day was an alteration of the affinity of the tissue cells for water as the result of an altered metabolism. The idea of anaphylaxis was introduced by Richet in 1900 as the antithesis to prophylaxis. In 1906 von Pirquet introduced the term allergy to include all conditions of altered reactivity. A more precise chemical connotation had been given by Sir Henry Dale's researches on histamine in 1910, followed by Sir Thomas Lewis's observations on the vascular reactions in the skin. A substance toxic to everyone was apparently only liberated in the tissues of certain people in answer to stimuli which were innocuous to everyone else. Lewis had shown that for one of the reactions he observed, the sensory nerve-fibres had to be intact while another was independent of the nerve-supply. Dale had observed that adrenalin directly antagonised histamine and that the vagal and sympathetic stimulation of the heart were indirect, being mediated through the liberation of chemical substances. Adrenalin was the best antidote to an allergic crisis because it neutralised histamine and stimulated the sympathetic, or inhibitory, nerves to plain muscle. For Langley's great generalisation in 1901 had taught that the effect of adrenalin on any part was the same as stimulation of the sympathetic to that part. Here was clear instance of the transformation of a nervous into a chemical action; the pituitary diencephalic apparatus provided others. This relationship between the chemical and nervous factors in the reaction of the organism to disease might be regarded as the actual growing point of knowledge.

DISCUSSION.

Sir ARCHIBALD GARROD spoke of William Hyde Wollaston, that man of wide attainments, physician, botanist, chemist, physicist, who had described the structure of all the urinary calculi except those of uric acid (which had been previously described). He said that William Prout had maintained that pure chemistry provided by the chemist was of little use to medicine; it was necessary for the physiologist to make himself a chemist. He had believed that chemistry would guide the physician as anatomy did the surgeon. Prout had recognised that urea and carbon dioxide were formed by the breakdown of tissues—facts which were rediscovered by Liebig. He also discovered the hydrochloric acid in the gastric juice, and seemed to have had a glimmer of the conception of enzymes.

Sir GOWLAND HOPKINS said that as one whom fate and circumstance had detached from immediate clinical interests he could acknowledge the great debt which chemistry owed to medicine. Just at the turn of the last century, he said, circumstances combined to give a special impetus to biochemical studies; the great advance in the chemistry of proteins, a realisation of the existence of hormones, and recognition of the functions of the endocellular catalysts in metabolism. To this impetus the work and thought of the previous speaker notably contributed. He went on to cite Liebig as illustrating in his work and teaching the circumstance that those who are concerned with the borderlands of knowledge must, in order to obtain the highest success, cultivate as far as is humanly possible the thought proper to both sides of the border. If Liebig had but had the biological training or, otherwise, had possessed the remarkable innate biological instincts of Pasteur his genius would have given biochemistry a status for which it had long to wait.

Sir WILLIAM WILLCOX referred to the great assistance biochemistry had rendered medicine in the twentieth century; the blood-urea in uræmia and sugar-tolerance curves were examples of the aid that had been given to diagnosis and prognosis. Adrenalin and thyroxin had been synthesised. The toxicologist had been enabled to think of the action of a poison after absorption instead of observing its effects on the stomach and intestines.

Prof. E. C. DODDS gave an account of the work of Hoppe-Seyler. He had crystallized hæmoglobin, had shown it to be a protein containing iron, and related to the blood-pigments of other animals. He suggested that hæmoglobin was the carrier of oxygen and demonstrated its absorption spectrum.

Dr. T. WATTS EDEN remarked that Owen Rees, F.R.S., must have done much of the chemistry for Bright.

Dr. T. IZOD BENNETT gave an account of the early history of nephritis. In 1829 Bright had noted the low content of protein in the blood of œdematous patients but it was not till 1914 that Epstein brought out the importance of this observation.

Dr. A. P. CAWADIAS said that the idea of biochemistry was introduced in the fifth century B.C. when Hippocrates first spoke of the modifications of the humours. Although he considered changes in blood, bile, and urine, he had not based his diagnosis on biochemistry because his knowledge was so incomplete. With the vast progress of the science our aim should now be to detect and treat the modification of the chemistry of the organs which must precede a lesion.

SECTION OF ANÆSTHETICS.

AT its meeting on March 4th, with Dr. G. RAMSEY PHILLIPS, the President, in the chair, this section discussed

Anæsthesia for Major Throat Operations.

Dr. C. W. MORRIS said these operations presented many difficulties. Respiration might be hindered by obstruction of the airway by the growth, and there was a grave threat of pulmonary complications. The surgeon must be allowed the maximum freedom for his manipulations—especially in lateral pharyngotomy. Degrees of embarrassment short of actual stridor and cyanosis must be recognised and minimised. A proportion of patients would not admit they had experienced difficulty in breathing, indeed they might not have been aware of it; only by close questioning could it be ascertained that at times they were short

of breath or found they could breathe more easily if the head was raised higher than usual. If such minor respiratory difficulties had not been recognised, embarrassment would probably become evident under anæsthesia, and especially during the second stage. Tracheotomy might then be unexpectedly necessary with risks which would not otherwise have been present. Lung complications accounted for the majority of fatalities. Oral sepsis must be vigorously corrected before operation on the throat, and though this might not be the anæsthetist's province, he was not uncommonly held largely responsible for pulmonary complications. After removal of teeth the gums must have soundly healed before the operation. Most of the subjects of serious throat operations were at or past middle age, and their mouths were seldom in really good condition. Packs soaked in cocaine and adrenalin were employed to render the mucous membrane analgesic, and they were instrumental in lessening the amount of general anæsthetic required. To make a tracheotomy opening in these cases was better than to carry out endotracheal anæsthesia; there was always the possibility that the tube might carry infection, or at its insertion might dislodge a portion of growth and so disseminate it in the lungs. A further reason was that a tube restricted the surgeon's field of activity.

For severe throat operations the anæsthetic of choice was chloroform with oxygen. Dr. Morris said he was aware of the existing prejudice against chloroform, and he was of course against its indiscriminate use in the wrong type of case. Mr. Wilfred Trotter had told him that during the time he had been performing these operations he had never had anxiety on account of the chloroform anæsthesia, and that was the speaker's experience over 20 years. There must be a free airway and plenty of oxygen. During the operation the patient was noticeably free from any tendency to congestion and hæmorrhage, and it was usual for him to leave the table with the coughing reflex present and the pulse little faster than at the beginning of the operation. In none of his cases had there been delayed chloroform poisoning. With modern apparatus the supply of oxygen could be kept separate from that of chloroform, and mostly no more than 3 to 4 drachms of chloroform per hour was required.

After tracheotomy the regular to and fro breathing was replaced by a different type—namely, one in which long periods of apnœa were followed by periods of dyspnœa—and this might persist throughout the operation, afterwards giving place to the normal breathing. Unless surgeon and anæsthetist were aware of this, they were apt to become alarmed and to perform artificial respiration in apnœic periods.

In the large group of cases in which the operation was away from the opening in the larynx and there was no danger of obstruction, one of the intratracheal methods was best. He preferred to apply the vapour under low pressure through a soft tube, which provided for a return airway and allowed of packing off the larynx. Passage of the tube by the nasal route had many advantages. For operations in the hypopharynx and on the cords and in which tracheotomy was necessary, he thought it might be better for the patient if the tracheotomy were always done under local anæsthesia and if time was allowed for him to accustom himself to that type of breathing, rather than for both procedures to be done under general anæsthesia at one time.

DISCUSSION.

Dr. LL. POWELL agreed with Dr. Morris's general plan, but preferred to use a bellows rather than a stream of oxygen to convey the chloroform.

Mr. LIONEL COLLEDGE agreed, as an operator in these cases, that the main principle was that there should be no respiratory obstruction. Tracheotomy was not necessary in every case. If respiratory obstruction was allowed to occur, it was usually too late to do tracheotomy, for the damage had already been done; the tracheotomy might restore the breathing, but after that the anæsthesia would not proceed quietly again, and if there was a pulmonary complication in that type of case it was not due to the anæsthetic as such but to the respiratory obstruction. He saw no object in using general anæsthesia for tracheotomy; it was much simpler and easier under a local anæsthetic, and from the beginning the anæsthetic could be administered through the tracheotomy tube. He had never seen trouble due to the use of chloroform. Delayed chloroform poisoning was relatively much more likely to develop in children and young adults. When the entire larynx had to be removed, if there was no obstruction—though often there was—it was useful at an early stage of the operation to open the cricothyroid membrane, put in a laryngotomy tube, pass the anæsthetising material through that, and remove the laryngotomy tube with the larynx. That obviated the necessity of doing a preliminary tracheotomy, and one had a clean wound, without risk of sepsis from a preliminary operation.

Dr. A. L. FLEMMING suggested it might be useful to add CO_2 to the mixture to overcome the apnœic phase after the performance of tracheotomy.

Mr. JOHN HUNTER endorsed all that Dr. Morris had said as to the use of chloroform in these throat cases. He found that the old men who usually required these operations took chloroform well, especially as the amount needed was materially reduced by the introduction of cocaine into the open larynx, and if morphia was used towards the completion of the operation this also lessened the required dose of chloroform. From the operative standpoint he did not see the need for the tracheotomy to be a separate preliminary procedure; it should be done at the same time as the main operation. But if obstruction existed, tracheotomy was required and the patient should be returned to bed to await the operation proper.

Sir FRANCIS SHIPWAY said he was glad to hear chloroform recommended. Where a tracheotomy tube was used in these cases it was impossible to give a fatal dose of chloroform. He had seen respiration arrested by a heavy dose, but though nothing was done it restarted. Nor did he think a continuous stream of oxygen constituted a danger. Prof. Buckmaster's work showed that during chloroform anæsthesia oxygen tension was reduced by 40 per cent., so there was no danger of over-oxygenating. Oxygen was needed because during chloroform administration there was a definite anoxæmia.

Mr. T. RITCHIE RODGER thought there was no sufficient reason for believing that injection of adrenalin was dangerous when chloroform was used.

Dr. J. BLOMFIELD said that the point of importance in regard to the use of adrenalin in these cases was the difference in its action when injected and when it was applied on a swab. In Dr. Morris's paper the reference was to the use of adrenalin on swabs. These caused no trouble, and that was also the speaker's experience. The trouble which had occurred with

adrenalin when chloroform was used was when it was injected.

Sir FRANCIS SHIPWAY referred to a case of chloroform anæsthesia for a mastoid operation in which adrenalin was poured into the wound to stop bleeding, and the patient died.

Dr. I. W. MAGILL said that Dr. Morris remarked that sometimes a general anæsthetic was needed for the tracheotomy but the speaker did not see why. He referred to a case of pulmonary and laryngeal tuberculosis, with much obstruction and cyanosis, in which the patient insisted on a general anæsthetic for the tracheotomy. He, Dr. Magill, decided to oxygenate the patient first, and introduced the oxygen under positive pressure through the small aperture in the larynx. That was very satisfactory to a patient who was suffering from laryngeal obstruction. His own practice was to connect up to the tracheotomy tube by a closed system, and he gave nitrous oxide and oxygen, with free medication, beforehand; chloroform could be added if necessary. In giving chloroform by the open method it was an advantage to have CO_2 also. He had been glad to hear the good word for cocaine, for its advantages were very certain. In a cocainised larynx administration of chloroform was one of the simplest and easiest forms of anæsthesia. Chloroform seemed to be the only anæsthetic a strong man with cancer of the larynx could take well, and he seemed to suffer no ill after-effects. Better results were obtained from nembutal if it were not used as a basal narcotic by itself; one should aim at a balanced anæsthesia, i.e., using some morphia and scopolamine an hour beforehand. Only a very small quantity of nembutal was then needed, and less was necessary to be eliminated from the system afterwards. Much of the restlessness of patients who had nembutal was due to their having had an overdose of it. There was no object in inducing deep sleep, it was preferable to have the patient at a stage in which he could answer questions. He had seen some successful total excisions of the larynx carried out under regional block anæsthesia; some patients did better under that than under a general anæsthetic.

Dr. HUGH PHILLIPS said that one of his practical difficulties was in the use of a lead delivery tube. This, on account of its weight, had a tendency to pull the tracheotomy tube on to one side. He had therefore had made a curved platinum tube, and attached this to a light indiarubber delivery tube. He had not found premedication necessary. The apnœic periods after carrying out tracheotomy could be quite alarming, and in these circumstances he turned on a little CO_2, with a few inhalations of ether, afterwards continuing with the chloroform. He agreed with what had been said as to the use of a local anæsthetic. He had never found any harm result from a swab of cocaine and adrenalin; it helped the anæsthesia, and the amount of chloroform required was thereby reduced.

SECTION OF THERAPEUTICS AND PHARMACOLOGY.

AT a meeting of this section on March 8th, with Dr. E. P. POULTON, the President, in the chair, a discussion on specific and non-specific

Desensitisation in Allergic Disease

was opened by Dr. G. H. ORIEL. Allergic disease and asthma, he said, were not necessarily synonymous; there was one type of asthma in which it was not possible to prove allergy. Allergy meant an altered reaction to a foreign protein, while asthma was only a symptom. Normally there was no antibody to protein in man; in sensitisation antibodies were present in the tissues but not in the blood-stream, while in immunity antibodies were present chiefly in the blood stream and to a less degree in the tissues. The ideal to be aimed at was to transform sensitisation into the normal state, but this was rarely accomplished. If a rabbit was sensitised to egg protein, egg precipitins appeared in the circulation; after a few months' rest these precipitins had disappeared but on the injection of a non-specific protein, such as T.A.B., the precipitins reappeared; in this case sensitisation had been transformed to immunity. Tuberculin, peptone, and T.A.B. had all been used in non-specific therapy.

In a case of asthma it was important to decide whether the condition was allergic or not. More than 300 proteins could be used for skin tests, which meant a tedious and exhausting process, especially as some asthmatics were positive for nearly all of them. All sensitised patients gave a positive test to human hair. Working in conjunction with Dr. Barber, he had found that a proteose was present in the urine of an allergic patient which gave a positive skin test in that patient. The proteose obtained from one asthma patient would give a positive result in another asthma patient who was sensitised to the same protein as the first. In the intervals between the attack there was little of the proteose to be found in the urine, often less than 1 per cent.; during an attack, however, it increased rapidly to about 10 per cent. and then fell again equally rapidly. This suggested that it was a break-down product; and it was important to determine whether this was so, for if the patient was sensitive to his own break-down products, treatment must be approached from that point of view.

In a passively sensitised guinea-pig an injection of proteose obtained from an allergic patient produced a typical uterine contraction. In the normal guinea-pig proteose produced only a small uterine contraction, and histamine a large one; in the sensitised guinea-pig the contractions produced by proteose and histamine were equal in size. These experiments indicated that the proteose substance was not identical with histamine. Four criteria must be fulfilled if a substance was to be accepted as the cause of asthma in a patient: (1) It should be capable of producing asthmatic attacks. (2) The Prausnitz-Küstner reaction should be positive. (3) It should be possible to use the substance to perform passive sensitisation. (4) Skin tests should be positive.

NON-SPECIFIC DESENSITISATION.

Prof. STORM VAN LEEUWEN said that after a visit and demonstration by Dr. Oriel he had prepared proteoses from 24 asthmatic patients; 11 of these had given negative skin reactions but the rest had been positive. Different persons reacted differently to the same drug, but it was only when the reaction was extreme that it was termed allergy. He found that those patients who reacted at all to Oriel's proteose also reacted very strongly to 1 in 10,000 histamine. He considered that Oriel's proteose might be responsible for some cases of allergic asthma. Those patients who reacted to human epidermis also reacted to proteose—in other words, they reacted definitely to products of the human body. The allergic patient differed from the normal person in that he was likely to become sensitised to any product capable of provoking sensitisation, provided that he came into contact with it.

It was well known that certain acute infections would improve the condition of an asthmatic patient; among these were lobar pneumonia, erysipelas, mumps, scarlet fever, and tonsillitis. Certain other conditions, however, had a harmful influence, and these included influenza, colds, measles, and bronchopneumonia. The problem was to decide what use could be made of this circumstance. Theoretically, it would be to the patient's advantage to induce pneumonia artificially, as malaria was artificially induced in the treatment of G.P.I. As this was impracticable, some less dangerous and more readily curable disease must be sought. Malaria had little effect in ameliorating asthma, and he had tried three other diseases. The first of these was dengue, which he had used in 12 cases. The second was a little known disease described in German as *Schlamm* fever, and which he had translated as "slime" fever, since there appeared to be no English equivalent; this disease was found in Russia and was due to a spirochæte, related to virus disease, but completely harmless. The third disease employed was a certain strain of recurrent fever. Attempts had been made to investigate the influence of these diseases on the blood in asthmatic patients, more especially on the eosinophil count, and on the acid-base equilibrium or pH of the blood. Most allergic patients and many asthmatics showed eosinophilia. It had previously been found that starvation, and also injections of sulphur in oil, had an effect in reducing this eosinophilia; as the temperature rose after a sulphur injection the eosinophils diminished, and at the same time the amount of adrenalin necessary to keep the patient free from attacks was much reduced. The rise of temperature associated with dengue was found to cause a similar reduction in the amount of adrenalin necessary to prevent attacks, but as a rule had little effect on the eosinophil count. The improvement in the asthmatic condition, however, lasted only two or three days, and infection with dengue showed no advance on the results obtained with sulphur. Slime fever gave sufficiently promising results to make further investigation desirable; in one case the reduction in the amount of adrenalin necessary to prevent attacks had been very marked. The strain of recurrent fever used was said never to kill any patient, and the improvement produced in some cases had been remarkable, all asthmatic attacks disappearing for months. The patient's sufferings, however, were severe during the feverish attack, and some drug was essential to prevent recurrence. Salvarsan was not effective for this purpose in the artificially induced disease, and another drug not yet on the market, after being employed successfully in 45 cases, failed to prevent recurrence in the final three. Some other drug or some more reliable method must therefore be sought. It was found that these diseases had no demonstrable effect on the pH or CO_2 content of the blood. This form of therapy was chiefly effective in bronchitic asthma, and not the other forms.

Most asthmatics gave a strong positive reaction to tuberculin, and although non-specific therapy of this type was much less dangerous than induced disease, it had met with considerable resistance from the medical profession. If could not cure every patient, of course, but it was capable of producing improvement which might last for months, though it would have no effect if the patient was coming into contact with massive doses of allergin as soon as he left the clinic. Peptone injections, Prof. Leeuwen considered, were not dangerous if given intramuscularly but might cause death if given intravenously. What factor was responsible for the effects of non-specific therapy was still an open question.

CLINICAL EXPERIENCE.

Dr. C. S. BRUCE PEARSON described a positive skin test as a strong, large wheal with pseudopodia and definite persistent erythema. He quoted the results obtained in a series of cases with 0·025 c.cm. of urinary proteose in a solution of 1 in 100,000, which showed that asthmatic patients reacted much more readily and intensely than normal controls. Experiments made with solutions of 1 in 1000 had produced doubtful reactions in some of the normal control cases. There was no sharply defined limit between normal and allergic persons; most people showed signs of allergy at some time during life, usually in the form of an attack of urticaria.

Dr. W. P. STAMM described a case of angioneurotic œdema in a woman of 48. On Dec. 23rd, 1931, she had developed urticaria, which had recurred daily until Dec. 28th, when she had an acute attack of œdema of the face and lips. She was treated in the out-patient department with intramuscular injections of blood; fish and meat were excluded from her diet. The œdema disappeared but the daily attacks of urticaria continued, and on Jan. 30th, 1932, she was admitted to the wards of Guy's Hospital. Dr. Oriel had prepared her urinary proteose from a specimen obtained during an attack. She was given a skin test dose with a dilution of 1 in 10,000, which produced a positive reaction at 4 P.M. At midnight she had a severe attack of œdema. On Jan. 15th, 0·1 c.cm. of a 1 in 1,000,000 solution of proteose was given, and again an acute attack of œdema developed at night. On Jan. 18th she was given 0·2 c.cm. of a 1 in 1,000,000 solution, and no reaction followed. From then onwards the doses were repeated at increasing intervals, and she had no further attacks of œdema or urticaria.

Dr. JOHN FREEMAN said that he gathered that Dr. Oriel and Prof. Leeuwen regarded sensitisation to proteose as parallel to sensitisation to some product of a damaged part of the body. He had long thought that sensitiveness to iodide, for example, must be due to a product of iodide with some substance in the body rather than to iodide itself, but this was a long way from the conception that every man was sensitive to his own proteose. He was interested in the use of artificially produced disease as a method of reducing asthmatic attacks. In his experience severe colds had a similar effect, and he had always taken it to indicate that the patient had acquired immunity to some air-passage organisms to which he had previously been sensitive.

Dr. H. W. BARBER said that he had been using proteose therapeutically for two and a half years, and had come to the conclusion that it was in a different category from non-specific desensitising agents such as T.A.B. and tuberculin. He believed that any psychological effect could be ruled out. It was necessary to find the dose which provoked no reaction and upon which the patient improved; once found it should not be increased. In many cases the method had failed and had been abandoned, but on the whole he had had better results with it than with any other form of desensitisation which he had used.

Dr. GEORGE BRAY suggested the possibility that reactions to human hair might be due to the presence

of dandruff which contained histamine. In America diathermy had been used to produce high temperatures but as soon as the fever disappeared the asthmatic attacks returned. Was there a possibility that proteose treatment would so restore the patient that he could return to his feather bed or to dangerous articles of diet? He thought the best hope of success lay in combined treatment. Some patients were free from attacks on histamine and adrenalin.

Mr. FRANK COKE remarked on the benefit experienced by asthmatic patients during pregnancy, as well as following certain infections. He could not understand how patients could be sensitive to human hair unless it had been changed by mould.

In replying, Prof. VAN LEEUWEN said that hair and superficial layers of skin were taken from the limbs where the presence of moulds was unlikely. Histamine could be prepared from the skin, but the effects obtained with proteose were quite unlike the effects of histamine.

Dr. ORIEL, in his reply, thanked Prof. Leeuwen for the great interest he had shown in the work on urinary proteose.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this society on Feb. 4th was devoted to

Backache in Women.

Mr. HAROLD F. SEYMOUR said he thought the condition was less common than it was 20 or 30 years ago, this being due to the much healthier bringing-up of girls to-day. Whilst approving of sports and gymnastics for women, he deprecated excess and said there was a danger of producing a male type of pelvis in young women—with its obstetrical disadvantages—if sport was indulged in excessively. There never could be physical equality between the sexes. His remarks were confined to low backache in the sacral region, and he referred only briefly to gross disease such as large fibroid tumours, incarcerated ovarian cysts, salpingitis, and carcinoma. Where gross pelvic disease has been excluded, he considered there were three main causes of backache—namely, retroversion and retroflexion of the uterus, chronic cervicitis, and prolapse. In the treatment of retroversion pessaries should be used only temporarily. A Hodge's pessary would often cure a retroversion occurring after the puerperium. Persistent retroversion causing backache and other symptoms should be treated by a round-ligament shortening operation. Chronic cervicitis, he thought, was best treated by anæsthetising the patient and deeply cauterising the cervical canal after dilatation. Diathermy too was good, but he preferred the actual cautery. Bad cases not yielding to such treatment were best dealt with by amputation of the cervix. Prolapse, except in a very few cases, was due to injuries to the cervix and pelvic floor during childbirth. He thought it an obstetrical disgrace to allow small women to give birth to large children. Inductions should be done for women with only the bare normal pelvic measurements, where the child was obviously over 7 lb., and so much prolapse would be avoided. Primigravidæ over 40 should always be given the choice of a Cæsarean operation. In the treatment of prolapse pessaries should not be used except as a temporary measure, where it occurred after the puerperium and was simply due to lack of muscular tone. Persistent prolapse should be operated on, and by the vaginal route. The surgical treatment of prolapse was perhaps the most satisfactory of all operative procedures, at any rate it gave the patient complete satisfaction. She felt after the cure of her prolapse that she had returned to the time when she was a nullipara. He hoped the profession would point out the advantages of the vaginal operations for prolapse, and not let women go on wearing insanitary pessaries for years and years, when they could be made clean and well by an operation which cured their backache too.

Mr. RALPH BROOKE suggested that 80 per cent. of cases of low back pain were gynæcological in origin, and the remaining 20 per cent. orthopædic. He pointed out that in the female the posterior pelvic or sacro-iliac joints remained comparatively lax throughout life—an adaptation to function, the important female function of parturition. Sacro-iliac disorders occurred far more commonly in the female sex and at a period when the joints were most movable. Pregnancy had a great influence on the sacro-iliac diseases and injuries, owing, amongst other things, to the increased mobility of the joint at that period. At term the range of movement was increased approximately two and a half times above the maximum in the non-pregnant woman. The return of joint stability of the pelvic joints was closely related to the normal uterine involuntary changes, and uterine subinvolution was associated with a persistence of the lax conditions of these joints which was present at term. The practical application of this was seen in women who rose too early after the labour, which was complicated by uterine subinvolution. In these cases low back pain, other than uterine in origin, was a persistent symptom. Disparity between the size of the fœtal head and the maternal pelvis was another cause of disturbance in the normal anatomical and functional state of the pelvic joints, and the passage of an abnormally large head through the pelvis might lead to over-stretching of the sacro-iliac ligaments with the associated symptoms of joint strain, followed later on by those of a partial subluxation or a secondary traumatic arthritis. Partial subluxation of the joint might occur in women after pregnancy, and was usually traumatic in origin. Radiography was not of great assistance in the diagnosis of partial sacro-iliac subluxations or displacements. Arthritic changes could be demonstrated with greater certainty. Joint laxity might be treated by means of a light brace, or in less severe cases, a strong corset. Manipulation under anæsthesia was useful both as a curative measure in cases of partial subluxation, or when the pathological change was in the nature of a peri-arthritis. It was also useful in the differential diagnosis of strain and subluxation from early arthritis. In the latter a temporary increase in the amount of pain resulted from the manœuvre, but this was easily controlled by a light brace with a pelvic band and sacro-iliac pads. Operative fixation was not on the whole indicated, and should be regarded as a last resort when all other measures had failed.

Much could be done to prevent the many years of intractable backache and pain which many women suffered after pregnancy, if the period of rest in bed after childbirth was governed by the state of the pelvic joints. Persons suffering from delayed involution of the uterus required a much longer period of rest in the horizontal position. The same thing applied if the child was of large size, or the head showed marked moulding.

REVIEWS AND NOTICES OF BOOKS

Traité de technique opératoire oto-rhino-laryngologique.

By GEORGES PORTMANN, Professor in the Faculty of Medicine of Bordeaux. Paris: Masson et Cie. 1932. 2 Vols. Pp. 865. Fr. 250.

WITH the collaboration of his assistants in the Clinic at Bordeaux, Prof. Portmann has produced a valuable treatise on the operative surgery of the ear, nose, and throat. The text is laid out in tabular form arranged under the headings of indications, preparation of the patient, anæsthesia, instruments, and technique. While this makes the description of the actual operation clear and easy to follow, so condensed a method is less suitable to the discussion of the indications for an operation, the advisability of which in any individual case may be doubtful. The work begins with a description of general principles, and of the arrangement of the operating theatres, and includes an illustrated account of the theatres in Prof. Portmann's clinic. Details such as methods of illuminations are discussed, and the so-called diathermy knife is described. The method of diathermic coagulation which is in more general use in this country is not mentioned; presumably Prof. Portmann does not employ it.

The greater part of the first volume is occupied by operations on the ear, and includes a chapter on antrotomy in infants and one on the "conservative" mastoid operation; for the last named operation the indications are said to be very restricted. Curettage of the jugular bulb is advised when incision of the lateral sinus downwards fails to reach the blood current, and ligature of the jugular vein in all cases of involvement of the lateral sinus is regarded as a necessary complement to opening the sinus. The second volume is occupied by operations on the nose and throat. Prominence is naturally given to the treatment of tumours of the nasal fossæ and its accessory cavities by the transmaxillo-nasal route, designed by Prof. Moure, the author's predecessor in the Clinic at Bordeaux. Prof. Portmann describes his practice in connexion with the operative treatment of suppuration in the accessory nasal sinuses. In the operation on the maxillary antrum by the canine fossa route, he recommends a thorough curettage and the removal of the entire lining of the cavity, which is then swabbed out with 10 per cent. solution of chloride of zinc; he respects the inferior turbinal for fear of subsequent atrophic rhinitis. In operating on the frontal sinus, Prof. Portmann makes a wide removal of the anterior wall in order to treat its mucosa in the same way, and he introduces a packing of iodoform gauze from the sinus into the nose to maintain the permeability of the ostium. For tonsillectomy in children he employs the guillotine, describing the operation as that of Sluder-Ballenger; but he uses the finger, and not the eminence of the mandible, to push the tonsil through the ring, according to the method first described by Whillis and Pybus of Newcastle. For adults he uses dissection and snare, and ligatures bleeding vessels; he does not give details of how the ligatures are tied. Of the laryngeal operations, thyrotomy is described with removal of part of the thyroid ala as advocated by StClair Thomson; when a portion of the cricoid is also excised, the operation is described as a partial laryngectomy, but it is acknowledged that there is but a small difference of degree between the two procedures, and that no formal method exactly is suitable to every case. Total laryngectomy from below is the only method discussed, Glück's method of extirpation from above not being mentioned. The outstanding feature of the work is the illustrations, of which there are 467 in addition to two coloured plates. In connexion with many of the major operations photographs are shown of the surgeon's and assistant's tables, laid out with the instruments required; these are often nearly identical, for the same instruments are used in many similar operations and larger figures to show the details of the less known patterns would have been more useful. Most of the illustrations however are full-page plates depicting the various stages of operative procedures; beautifully drawn and reproduced, they give so clear a conception of the operations that further explanation is hardly required, although a short description is appended to each plate. There is no index, and a table of contents only at the end of the second volume.

Prof. Portmann has not attempted a systematic exposition of all the operations of surgery performed in this field, but has only set out to describe those practised by himself; the work will none the less be a valuable guide to those embarking on this specialty.

A Text-book of Surgical Pathology.

By CHARLES F. W. ILLINGWORTH, M.D., F.R.C.S. Edin., and BRUCE M. DICK, M.B., F.R.C.S. Edin. London: J. and A. Churchill. 1932. Pp. 677. 36s.

THE title of this work makes us regret the sonorous and dignified days of our ancestors, one of whom might have published "A Treatise on such aspects of the Science of Pathology as are of peculiar interest to those who practise the Art of Surgery." Other times, other titles, and we have no doubt that within a few months Messrs. Illingworth and Dick's book will be recognised, if not by all those who practise surgery, at least by most of those who aspire so to do, as containing an admirable presentation of that part of pathology which it is of most service for them to know.

The book differs from others of its kind in that some knowledge on the part of the reader of the basic processes of pathology is assumed, and the usual chapters on inflammation, injury and repair, gangrene, and so forth are omitted. There are, however, brief chapters on shock, burns, the pathological effects of irradiation, tuberculosis, actinomycosis, arogenic infections, and echinococcus disease, though syphilis, streptococcal and staphylococcal, and other common infections are not specifically dealt with. And there is a chapter on the general pathology of tumours which contains far more than is usually included in work of a general character. The great bulk of the book is devoted to the lesions of the various systems which are related to surgery. The subject matter is well chosen and attractively presented, and the teaching is essentially modern. There are upwards of 300 illustrations of naked-eye and microscopic preparations including several radiograms. For the most part they are excellent but a few are below the general standard, rather because they have been ill-chosen than because they are poor reproductions. Fig. 58, for example, does not give a true impression of an osteoclastoma; nor does Fig. 165 represent an average epithelial odontome. Here and there occur a few statements which no doubt will receive further consideration in future editions—for instance, is it

correct that the lungs are only rarely infected primarily by the tubercle bacillus? And is it true (p. 50) that hypernephroma occurs in fused or malformed kidneys? At any rate, this phenomenon is not referred to later in the book where these tumours are described in detail. Stronger exception might be taken to the author's conception of the tumours derived from the skin and other parts of the body covered by similar epithelium. The separation of the basal-celled carcinoma (rodent ulcer) from the squamous carcinoma by the group of glandular carcinomata (pp. 67 et seq.), the statements on p. 354 that a malignant change may supervene in a basal-celled carcinoma (rodent ulcer), and on pp. 588–89 that an epidermoid carcinoma of the pelvis of the kidney is so called because it has a certain similarity to carcinomata of the skin or mucous membranes, tend to perpetuate a state of confusion about these tumours which is unfortunate and unnecessary. The general format of the book leaves nothing to be desired, and the price is reasonable.

Ultra-violet Therapy.

A Compilation of Papers forming a Review of the Subject. By AUSTIN FURNISS, L.R.C.P., L.R.C.S., L.D.S., D.P.H. London: William Heinemann (Medical Books), Ltd. 1931. Pp. 365. 12*s.* 6*d.*

SOME of the papers collected by the author in the present volume have previously been published in medical journals. Presented now in book form they give a fairly comprehensive and up-to-date review of the whole subject of actinotherapy. The treatment of the subject is elementary throughout, but the facts are carefully presented and well documented with references to the more important work carried out by research workers in this country and abroad. Like other books intended for both doctors and laymen this volume proves at times irritating to the medical reader. The notes on general medicine and pathology do not credit the reader with even an elementary knowledge of the subject, while such brief explanatory remarks cannot be of much use to lay readers. The book forms a good introduction to the study of actinotherapy.

Röntgenuntersuchung und Strahlenbehandlung der Speiseröhre.

By Dr. JOSEF PALUGYAY, Privatdozent für medizinische Röntgenologie; Leiter der Röntgenstation der II. chirurgischen Universitätsklinik in Wien. Vienna: Julius Springer. 1931. Pp. 391. R.M.59.60.

THIS book is an illustration of a method characteristic of German scientific investigators which never fails to arouse wonder and admiration in other countries. The œsophagus is a simple organ with a single function; but on the radiology of the œsophagus alone Dr. Palugyay has compiled a work of nearly 400 pages without repetition or verbosity. He has, he explains, tried to set down the lessons he has learnt in the 12 years which he has devoted entirely to the investigation and treatment of the œsophagus in coöperation with eminent surgeons. He gives considerable space to the methodical correlation of his findings with the known physiology and pathology of the œsophagus and makes an unusually valuable contribution to its normal anatomy and physiology—a vitally important study to which too little attention has been paid. He makes no mention, in the section on the swallowing mechanism, of the negative pressure theory, but the cinematographic diagrams he reproduces seem to confirm this theory. After a long and carefully ordered study of the radiological pathology, based on an exhaustive classification, he deals fully with disease, including a special section on foreign bodies, the results of operation, and operation controlled by radiology. In the therapeutic section the use of radium and X rays singly and in combination is considered. The bibliography is, of course, comprehensive. The illustrations are as good as half-tone reproductions of radiograms can be, but much detail is necessarily lost. The line drawings, of which the book contains a considerable number, are well executed and convey much more information.

The book should be used as a work of reference by all radiologists confronted with specific problems in the investigation or treatment of the œsophagus.

Modern Methods of Feeding in Infancy and Childhood.

Third edition. By DONALD PATERSON, M.D., F.R.C.P., Physician for Diseases of Children, Westminster Hospital; Physician to Out-patients, Hospital for Sick Children, Great Ormond-street; and J. FOREST SMITH, F.R.C.P., Physician to Out-patients, St. Thomas's Hospital. London: Constable and Co. 1931. Pp. 170. 7*s.* 6*d.*

THIS book has already established its reputation as a guide to infant and child feeding. It is scientific in conception, practical, and easy to read. The third edition is slightly larger than its predecessors; there are few significant alterations, but the text has been rearranged and new tables are included. Some minor changes have been made in the diets recommended for older children, more stress being laid on the necessity for limiting fats. The book is among the best of its kind, and will be useful to students as well as to practitioners.

Infection and Resistance.

Fourth edition. By HANS ZINSSER, M.D., Professor of Bacteriology and Immunity, Medical School, Harvard University. London: Macmillan and Co., Ltd. 1931. Pp. 651. 35*s.*

IN the preface to this new edition of his popular text-book Prof. Zinsser expresses the opinion that books on immunology should either be revised every ten years or destroyed (except for a few museum copies). It is eight years since he published his third edition, and it is a matter for congratulation that he has decided in favour of rebuilding as against destruction. The book has been completely rewritten, but by careful pruning and the abandonment of worn-out theories he has made it actually a few pages shorter than before. There has been some rearrangement of the various sections. Special chapters on antigens and antibodies have been added, and hypersensitiveness is now discussed on the definite assumption that this phenomenon in man is essentially identical with anaphylaxis in animals. The application of the general principles of immunology to individual infectious diseases is dealt with in a separate section, which include a fair presentation of what is known about immunity to virus diseases. The literature dealing with immunology has become so vast that only those actually immersed in the subject can claim to more than a superficial acquaintance with it. Prof. Zinsser has produced a balanced and authoritative review which will continue to be valuable, not only to immunologists, but to workers in other branches of pathology.

THE LANCET.

LONDON: SATURDAY, MARCH 12, 1932.

THE LAW OF MEDICAL PATENTS.

THE recent annual report of the Medical Research Council recalls attention to the need of revising the law of patents of medical discovery. The Council's views had already been laid before the Departmental Committee which was appointed in 1929, with a distinguished ex-Lord Justice as chairman, to consider the amendment of British patent law. The Committee, when it reported last year, set forth the Council's recommendations but found itself unable to support them. Concerned, perhaps naturally, with commercial rights, with the standardisation of Board of Trade practice and with the general legal position, the Departmental Committee declined to contemplate any special treatment of medical patents. It was doubtless impressed also with the difficulty of reconciling conflicting interests and opinions. But, whatever the reasons for the Committee's decision on this point, we have to reckon with the fact that, in any future amendment of the law, the Board of Trade is likely to follow the advice of its Committee unless public opinion expresses itself strongly to the contrary.

British patent law took shape 300 years ago. The abuse of prerogative grants of monopoly in Elizabethan times is ancient history. The QUEEN postponed a crisis by one of the ablest speeches ever delivered to Parliament, but a recrudescence of popular grievances caused JAMES I. to bow to the storm. In 1624 the Statute of Monopolies swept away all monopolistic privileges except fourteen-year grants in favour of persons who had invented or introduced a new discovery. British patent law, concentrating upon the three elements of novelty, utility, and inventive merit, has been developed from that Statute. Though patents for projects of alchemy were not unknown, the early law scarcely contemplated application to medical discovery. In 1739, when Parliament was ready to reward JOANNA STEPHENS with £5000 "upon a proper discovery to be made by her, for the use of the public, of the medicines prepared by her for the cure of the stone," a patent could hardly have been deemed appropriate. So far as "the use of the public" is concerned, patent law came a little nearer to our present problem when in 1859 an Act enabled improvements in instruments or munitions of war to be assigned by the inventor, "for valuable consideration or without," to the Secretary of State for War. The next development for our purpose is as recent as 1919. The war had revealed a shortage of medicine and drugs often the subject of patent rights in this country. Section 38 A (2), then inserted in the principal Act, enabled the comptroller of patents to grant licences where patents existed in respect of food and medicine, thus restricting the effect of a monopoly. In settling the terms of the licences or the amount of the royalties, he was to "have regard to the desirability of making the food or medicine available to the public at the lowest possible price consistent with giving to the inventor due reward for the research leading to the invention." This formula bred dissatisfaction because it recognised and encouraged the derivation of private gain from the patenting of medical inventions. The medical profession has its ethical principles and is unaccustomed to the idea that a practitioner should profiteer in respect of a discovery in the medical field. There are no notices in that field warning trespassers that they will be prosecuted. Our research workers have their traditions of publicity and coöperation. But voluntary abstention from patenting has the disadvantage that the results of British medical research may be exploited by others, especially foreigners, who are not amenable to those traditions. And our chemical manufacturers must have some protection. To meet these difficulties a scheme was proposed for the compulsory dedication, in the public interest and under State administration, of all patents for inventions subserving medical purposes. The Departmental Committee weighed the opinions for and against this proposal. The medical profession proved not to be unanimous. Workers in applied pathology and preventive medicine suggested that it was ethically no worse to reward research which reduced human suffering than to give a surgeon or physician a fee for his services. There were manufacturing chemists who declared that medical inventions were already hampered by Section 38 A, and that further restriction would discourage research by commercial firms or, alternatively, would encourage secrecy as a method of monopoly. In the end the Departmental Committee decided against compulsory dedication on the ground that it would operate adversely to the British fine chemical industry and discriminate unfairly against our research workers.

The Medical Research Council's proposal is more sweeping. Aiming higher than individuals' royalties and aware of the traditional disinterestedness of professional ideals, the Council wishes Britain to abolish altogether (as certain other countries have already done) the right of patenting medical discoveries. Obviously, commercial interests will be prejudiced by such abolition unless all the nations agree. Until international agreement is attained, the Council looks not unfavourably upon the dedication scheme; but the legislative amendment which the Council advocates is "the total abolition of the right of patenting in the medical field or some nearly equivalent restriction of that right." The arguments of the Medical Research Council may be briefly repeated. Patent rights exist in order to stimulate discovery. They are not required in the medical field because the worker abjures recourse to patents; he has

always pooled his knowledge gladly and the incentives are not financial. Patent law, it is added, was not meant for discoveries in biology or medicine; biological discovery is often so difficult to define precisely for the purposes of patent practice that there is risk of staking out claims wide enough to limit other explorers unduly. There is a danger too that the patenting of a medical discovery for personal profit will lead to a scramble for proprietary rights in further applications of that discovery where inventive merit may have had no influence or opportunity. The Council has had its own experience of patent rights. It does not desire them for itself. It accepted the British rights in the preparation of insulin in order to secure standard strength and quality and to prevent the marketing of inferior preparations. As soon as the Therapeutic Substances Act was passed in 1925 these objects were secured under Government control and thenceforward the Council made no further use of its patent. A second instance, the Steenbock case, provides the council with an illustration of its argument. With the aid of public money British research produced vitamin D in highly potent form by the ultra-violet irradiation of ergosterol; when our manufacturers were given the chance to apply the discovery, a British patent granted to Prof. STEENBOCK, of Wisconsin, was found to be an obstacle. The Council has published its reasons for saying that this patent is founded on the earlier and unpatented discoveries of various workers, and notably of British workers, and for holding it unreasonable that he should have the power to control the results of so much previous and subsequent work. We have also, it seems, to reckon with patent rights held for profit by foreign universities; the restrictive result is the same whether the proprietor is an individual or a corporate body.

To these arguments, as already stated, the Departmental Committee replies in effect that no case is made out for special treatment of medical patents—the medical field is like any other field and the disadvantages of patents of monopoly are more than offset by increased stimulation of industry and invention. As for the ethical considerations the Committee's attitude is that, if the medical profession has a special code, well and good—let it continue to enforce it. "But we feel strongly that the code should not operate to discourage that full coöperation between laboratory and clinical investigations which is essential to progress in this important field of human welfare." The findings of the Departmental Committee, we repeat, are likely to shape the policy of the Board of Trade; but the commercial aspects of our problem ought not to engross attention in its treatment by Parliament. The Ministry of Health knows that other interests are at stake. The Therapeutic Substances Act, with its Advisory Committee and its statutory machinery for licensing and testing, seems to offer a possible solution. The scheme for compulsory dedication of patents would be strengthened if production under a dedicated patent were brought within the Act. Nothing, however, is likely to be done unless some proposal can be put forward with the reasonable hope of agreement.

STAPHYLOCOCCAL IMMUNITY.

IT has been stated by a medical pessimist, strangely enough a surgeon, that a scientific fact is something determined by experiment which remains true for not less than two or more than five years. It is true enough that science has an uncomfortable habit of development—that the examination howlers of to-day may be the prize-man's answers of to-morrow is in some cases hardly an exaggeration. A new discovery, such as that of the rôle of the staphylococcus in infection, at first seems adequate in itself. But analysis shows the pathogenicity to be complex; and the discovery of each separate pathogenic weapon of the organism only emphasises that other and more important weapons are undiscovered. Immunology to-day has become an awe-inspiring subject. The tendency of bacteria to vary, to produce a large variety of distinct changes on tissues, to evoke a number of specific antibodies, and yet to maintain a fundamentally constant personality, is highly confusing. In time, we may be sure, conceptions will become simplified. All toxins have as much in common as in contrast; antibodies as a class have their similarities. Perhaps in the event the pure chemist, with his analysis of the behaviour of colloids, will reduce all our toxins, hæmolysins, agglutinins, and the rest to simple terms of colloidal structure and aggregation. Meanwhile, we must be content to suppose the existence of distinct causal entities from the study of distinct phenomena, and to leave to the future the unifying conceptions.

Recent work on the staphylococcus emphasises the analytical tendency in immunology. Two facts are quite obvious. The living staphylococcus can kill an animal; and from the staphylococcus substances capable of killing and otherwise damaging animals can be separated. But, although this nocuous power of filtrates has been analysed, and although antibodies can be prepared, it is not possible to protect animals against the living organism, so as to prevent eventual death, by means of antisera. Since, however, it is possible to recover from staphylococcal infections, it follows that immunity is not solely, or even mainly, dependent on the antibodies which have been discovered, and that pathogenicity of the organism is based on elements other than those determined by the most elaborate analysis. The paper by Dr. P. N. PANTON and Dr. F. C. O. VALENTINE in our last issue, and the work of Dr. O. GENGOU,[1] bring the process of analysis one step further. Filtrates of staphylococci will produce necrosis of skin, lysis of red cells, and destruction of leucocytes, and will kill a rabbit. Complete neutralisation of these phenomena can be procured by antisera. It is shown that different strains of staphylococci produce these nocuous substances in different

[1] Ann. de l'Inst. Pasteur, February, 1932, p. 135.

proportions, and that, in particular, the formation of leucocidin is a consistent feature of pathogenic strains. GENGOU lays stress on the fact that it is the filtrate which produces these changes; the dead staphylococcus is harmless when washed, and cannot evoke antibodies of this type. He has further shown that the organism when lysed by bacteriophage is innocuous, and does not produce antibodies of antitoxic value. By using various combinations of organism, lysed organism, and filtrates he failed to protect animals against living staphylococci. It is impossible, however, to neglect the action of these nocuous substances, on whose distinction from each other PANTON and VALENTINE insist, in the production of infection, or to refuse the possible aid of antisera. It is known that the antistreptococcal sera will fail to protect rabbits against eventual death from living cultures; but they will delay it for many weeks. Antisera might thus be expected, in human staphylococcal infections, to convert a lethal infection to a sublethal one; and, above all, to offer a chance of localisation and abscess formation, which is the best prognostic sign in septicæmia. And this analysis of pathogenicity will probably serve in the selection of strains for immunisation of animals, to procure sera with optimum and selective antibody characteristics.

One point, however, is often overlooked in the consideration of pathogenicity of organisms. It is certainly not outside the bounds of possibility that recovery from infection by an organism may be associated with a mutation of that organism, associated with diminished virulence. Such mutations may be imposed by an immune state in the infected individual; and mutation can in fact be imposed in vitro by immune sera. In any epidemic infection, towards the end of the epidemic, cases tend to be less severe. Epidemics do not end with the infection of all susceptible individuals; it is more probable that the virus is attenuated. It is possible that in the future therapy on this basis may be developed; the logical line of advance at present surely lies in the analysis of pathogenic action, and the utilisation of all established specific antibodies with which research workers may provide us. And for their concrete services we can forgive them a great many syllables.

PSYCHALGIA.

QUOTING from lectures given by Sir BENJAMIN BRODIE in 1836, PRATT, GOLDEN, and ROSENTHAL [1] remark that they contain much concerning the neuroses that is not yet generally known by medical teachers and writers. Although BRODIE laid stress on the frequency of pains of hysterical origin, yet nearly all English and American physicians since his time have mistaken for organic disease those cases presenting severe localised pains of psychical nature. The usual false diagnoses are neuralgia, neuritis, or myalgia, though sacro-iliac disease, appendicitis, gall-bladder disease, peptic ulcer, colitis, irritable colon, ovarian neuralgia, and hypertrophic arthritis have played their part. Even in pre-anæsthetic days the patients willingly underwent the horrors of operation, and this fact Dr. PRATT and his colleagues take as evidence that the pain is not only real but very severe—an explanation probably too simple for the psychopathologist, who would attempt to find deeper and unconscious motives at work. After a reference to CHARCOT'S caustic description of surgical intervention in such cases, they note that the development of technique since his day has increased needless operations on the victims of neurotic pain to an extent that no one can measure. A method of demonstrating the psychic nature of these pains was suggested by the work of SOMA WEISS and D. DAVIS on the effect of injecting percaine in the localised area of skin to which pain in visceral disease was referred. This as a rule abolished the pain, but only while the anæsthesia lasted. Used in cases of psychalgia, the percaine gave complete relief in 45 cases, or 83 per cent.; when a sham injection was given in a second group the results were even better, pain being abolished in 93 per cent. The duration of relief followed no rule, but varied from 3 hours to 18 months or longer. Five cases are described in detail, cure being claimed in one patient who had been subjected to 14 operations, including the removal of the appendix and both ovaries and the fixation of a floating kidney. Whether similar results would be obtained by others is uncertain, for the removal of hysterical symptoms by suggestion is haphazard therapy, but the experimenters have proved their point that numerous cases of psychalgia exist unrecognised and that hysteria, as SYDENHAM said, "most frequently occurs of all chronical diseases." They show how this prevalence has been emphasised again and again by various writers (eight are specifically cited) and we venture to doubt whether the failure to recognise it or to make a correct diagnosis in specific cases depends upon lack of knowledge. A recent correspondence in our columns [2] dealt with another aspect of the subject and stressed the need for the consideration of psychological factors by surgeons and gynæcologists; but SYDENHAM, BRODIE, and the others, reached correct diagnoses by methods that are surely still available. The cause of our failures appears to be not ignorance but a mental attitude that has persisted through the years in spite of protests. There must be a fundamental defect in a professional training that makes us ignore the nature of many of the common disorders for which people seek our help, and the remedy seems to lie in inculcating a different attitude rather than in adding to our knowledge.

[1] Pratt, J. H., Golden, L. A., and Rosenthal, J.: Jour. Amer. Med. Assoc., Feb. 6th, p. 441.

Manson House, the new headquarters of the Royal Society of Tropical Medicine and Hygiene, will be opened by the Prince of Wales at 5.30 P.M. next Thursday, St. Patrick's Day. The address is 26, Portland-place, London, W.1, and admission to the ceremony will be by ticket only.

[2] THE LANCET, 1931, ii., 999, 1157, 1210, 1265, 1324.

ANNOTATIONS

VENTILATION OF ROADWAY TUNNELS.

NAVIGABLE rivers are commercial assets to the districts through which they flow, but they offer barriers to communication between places situated on opposite banks. High-level bridges are of limited application, swing bridges are not very convenient either to vehicular traffic or navigation, subfluvial tunnels have therefore been adopted both here and in America as the best solution of the problem. Two early tunnels of this kind were pushed under the Thames, one at Blackwall in 1897, the other at Rotherhithe in 1908—both at a time when the horse was the principal means of haulage and seemed likely to remain so. The rapid development of internal-combustion engines and steam lorries has complicated the problem of ventilation which was simple enough when only the products of complete combustion, such as occurs in the animal system, were concerned. Natural ventilation has been found inadequate in removing to a safe degree the carbon monoxide, sulphur gases, and free carbon with tarry matter which result from the less complete combustion of fuel in mechanically propelled vehicles. In road tunnels of this kind the need for easy gradients has led to making long slopes on either bank with air shafts at intervals, utilising the caissons used during boring, which convert the tunnel from a simple U tube into one pierced in several places. These communications with the open air serve as inlets or outlets, according to the incidence of traffic, the varying air pressures and differences of temperature within and without the tunnel. Sections of tunnel between them may at times be filled with air which is, if not actually stagnant, at most oscillating to and fro without being drawn out of the tunnel. The products of imperfect combustion are at such times evident, not merely to the chemist, but by their effects on the well-being of those using the tunnel, more particularly those working in it. A further serious source of danger is the fog produced under these circumstances, which adds greatly to the difficulties of driving. In the event of a stoppage, due to a breakdown in the tunnel or to a traffic block at one end, the atmosphere becomes much worse, and serious malaise may be experienced. Tunnels which have been constructed since the advent of the mechanically propelled vehicle have been designed in the hope of overcoming these troubles. The experience of the London Underground railways with one-way tunnels has shown one direction in which improvements can be made. The construction of the roadway as an inner shell, surrounded by outlet and inlet channels for artificial ventilation by fan-driven air currents, ensures safe use even under the congested conditions of modern traffic. But it is one thing to project and another effectively to achieve, and one of the latest tunnels, that under the Mersey at Liverpool, has, almost on the eve of the opening ceremony, been found to have inadequate provision for ventilation.

In the Blackwall and Rotherhithe tunnels much improvement has been effected by the introduction of air at appropriate places. A scheme has been evolved by the engineering staff of the London County Council in collaboration with the chemical branch, and the work is described by Mr. C. J. Regan in a recent report [1] to the chief medical officer. In examining the effect of the progressive installation of currents of fresh air by means of fans, which was started at Blackwall in 1922 and at Rotherhithe two years later, Mr. Regan and his colleagues, on the advice of Mr. J. H. Coste, the L.C.C. chemist, have used Gautier's iodine pentoxide method, as modified by Teague, for determining the carbon monoxide, liquid air employed to remove the traces of hydrocarbon gases—pentane and hexane—which would interfere with the accuracy of the process. Humidity measured by a recording hair hygrometer, supplemented by a standard Assman wet and dry bulb instrument. Owens's air filter was used for measuring soot, and sulphur gases were determined by the Government chemist using a process based on G. H. Bailey's hydrogen peroxide method of oxidation of sulphur dioxide. The question of lead fumes from ethyl-petrol was left in abeyance. Consideration was given to the results of physiological experiments on the effect of carbon monoxide in varying concentration on human beings. In estimating a figure for the maximum allowable concentration of carbon monoxide in a tunnel in which men may be employed on maintenance work for several hours at a stretch, attention was paid to the conclusion of Sayers that long exposure to low concentrations of CO causes far more tissue damage than slight exposure to high concentrations; it was deemed advisable that the CO content should not be allowed to exceed 20 parts per 100,000. The New York State Bridge and Tunnel Commission, it is recalled, first adopted a standard of 40 parts per 100,000, stiffening it later to 25 parts per 100,000. It may surprise many people to learn that the air of busy town streets may contain an appreciable amount of carbon monoxide; Bloomfield and Isbell took 141 samples at peak traffic in 14 towns of the United States, and found average carbon monoxide content of 8 parts per 100,000. Connolly and others examined 690 street air samples in Chicago, of which 85 per cent. gave 5 parts per 100,000 carbon monoxide or less. The average figures varied from 5·3 per 100,000 in busy parts to 1·5 per 100,000 in suburban districts. In central London during the winter Mr. Regan has found an average of 3·4 parts of CO per 100,000. In the tunnels, however, the smoke or fog may become the limiting factor for comfort as soon as carbon monoxide, and the maximum allowable quantity of suspended matter was put at shade 6 of fog samples, being 1·92 mg. of black suspended matter per cubic metre. The highest daily average percentage of humidity of the tunnel air was 88 at Blackwall and 84 at Rotherhithe, and at no time was 100 per cent. reached at either place, clearly indicating that the fogs in the tunnels were not water vapour fogs. Mr. Regan's paper should be read by authorities contemplating the construction of underground garages or car parks, which may become death-traps for those who have to remain there for hours at a stretch, unless care is taken to ensure, under all conditions, an effective removal of products of combustion.

[1] London County Council. Annual Report, 1930. Vol. IV., Part III. P. S. King and Son. No. 2877. 5s.

RETURN CASES OF SCARLET FEVER.

WHATEVER the precautions adopted, from 2 to 4 per cent. of scarlet fever patients released from isolation initiate further cases of the disease within, as a rule, a short period of rejoining the family circle. Nearly 30 years ago A. G. R. Cameron pre-

pared for the Metropolitan Asylums Board, now merged into the London County Council, an exhaustive report upon the factors which appeared to be operative in the production of return cases of scarlet fever and diphtheria, and upon the efficacy or otherwise of hospital administrative methods designed to limit their occurrence. This report and a subsequent one to the same authority by F. M. Turner are classical. Although Klein in the 'eighties had described a "Streptococcus scarlatinæ," his work was either not accepted or ignored. Thus Cameron and Turner had not the advantage of bacteriological aid in their investigation of the infecting case of scarlet fever. With the acceptance of the hæmolytic streptococcus as the causal organism of the disease, it is natural that the possibilities of bacteriological control should be explored. Amongst others, U. Friedemann and H. Deicher [1] in Germany and M. B. Kirkbride, M. W. Wheeler, and C. D. West [2] in the United States have already made important contributions to the subject. A more recent investigation is that of J. E. Gordon,[3] of Detroit, who compares the value of bacteriological control in the uncomplicated and complicated case of scarlet fever. He finds that swabbing before discharge to determine the presence of the hæmolytic streptococcus in the throat of the uncomplicated case is not justified by results, as judged by the proportion of infecting cases after release. The uncomplicated case of scarlet fever may be discharged with equal safety after 28 days' isolation with or without swabbing. The infecting case rate was not greater for those proved to be carriers than for those shown to be bacteriologically free. In this connexion it is significant to note that W. Gunn and F. Griffith [4] reported that of 100 consecutive cases of scarlet fever, 49 harboured the hæmolytic streptococcus in the throat and six in the nose at the time of discharge from hospital, and that, so far as could be ascertained, not one of these 55 carriers acted as infecting cases. Kirkbride, Wheeler, and West found that only two out of 34 patients (6 per cent.) who were known to be carriers gave rise to return cases. Friedemann and Deicher [5] record that 100 per cent. of a series of cases were tonsillar carriers of the hæmolytic streptococcus after six weeks' detention in hospital. They seek to explain the low infectivity of the scarlet fever carrier on the grounds that the hæmolytic streptococcus loses virulence and toxicity in convalescence.

In the case of scarlet fever complicated by rhinitis, cervical adenitis, or otitis media terminal swabbing is an undoubted advantage. Gordon found that the bacteriological control of these cases materially reduced the period of isolation, and that the infecting case rate in this group was reduced from 11·9 per cent. amongst those not swabbed before release to 5·5 per cent. when two consecutive negative cultures were demanded. Rhinitis is of outstanding importance as a cause of infectivity: in Cameron's series 50 per cent. of the infecting cases had rhinitis at some time or other; in Gordon's series, although rhinitis and sinusitis occurred in only 14 per cent. of his cases as a whole, the condition was present in 40 per cent. of those which acted as infecting cases. Gordon distinguishes between the infectivity of purulent and catarrhal rhinitis. The hæmolytic streptococcus is present in abundance in the discharge associated with the former condition but is rarely recoverable in the catarrhal form. Cameron made the same distinction based upon observation alone. Cameron was of opinion also that otorrhœa, unless a morbid condition of the nose coexisted, was seldom associated with the production of return cases. The Ministry of Health Report on Scarlet Fever issued in 1927 also expressed doubts as to the infectivity of scarlatinal otorrhœa. Gordon believes that "the patient with suppurative otitis media is scarcely more infectious than the patient released after simple scarlet fever." In some fever hospitals in this country bacteriological control of the scarlet fever patient with complications of a suppurative nature is already being carried out with a view to reducing both the length of stay and the incidence of return cases. Routine swabbing of the uncomplicated case before discharge is clearly not called for. Gordon does not state whether his cases were treated with scarlet fever antitoxin. There is little doubt that antitoxic treatment by lessening the incidence of complications generally also tends to reduce the return case rate.

[1] Deut. med. Woch., 1926, lii., 2147.
[2] Jour. Infect. Dis., 1930, xlvii., 16.
[3] Jour. Amer. Med. Assoc., Feb. 13th, p. 519.
[4] Jour. of Hyg., 1928, xxviii., 250.
[5] Zeit. f. d. ges. Krankheitswesen, 1926, No. 11, p. 333.

MORTALITY AMONG SANATORIUM PATIENTS AFTER DISCHARGE.

AN interesting supplement to the studies of Dr. Noel Bardswell and others in connexion with the ultimate fate of sanatorium patients is to be found in a monograph [1] by Dr. F. Lange-Nielsen, published under the auspices of the Norske Videnskaps Akademi and with the financial support of the Nansen Fund. An English summary at the end, and English captions to the tables, do much to illuminate the text, which is in Norwegian. The study does not make cheerful reading. The patients discharged from the public sanatorium of Grefsen in the period 1910–1916 numbered 887 men and 1065 women, belonging chiefly to the working-classes. When the investigation of the subsequent fate of these patients was completed at the end of 1921, only 26 could not be traced. In 1924 Dr. Sofie Tillisch, who had worked as her husband's assistant at the sanatorium, produced a preliminary account of this material which has now been rearranged with the aid of statisticians. While the actual number of deaths was 1056, the number of deaths among the same number in the general population would have been only 88·1. In other words, the mortality among these ex-sanatorium patients was twelve times greater than the normal, and their expectation of life was no better than that of Norwegian males at the age of 80. Yet the average age of the patients on discharge from the sanatorium was only about 28 years. It should, however, be noted that approximately half the patients belonged to the third Gerhardt-Turban stage of the disease, and that the mortality after discharge among the first-stage patients compared with that of the general population was only as 2·7 to 1. From this figure of 2·7, the mortality rose to 7·5 for second-stage patients, and to 27·5 for third-stage patients. In his discussion of his findings Lange-Nielsen draws attention to the remarkably low mortality among first-stage patients during the first year after discharge, and he is inclined to credit sanatorium treatment with a goodly share of this achievement. But in the absence of a similar body of tuberculous patients not given sanatorium treatment, he has been unable to make that comparison which, more than any criterion, would have enabled him to form an

[1] Dödeligheten Blandt Sanatoriebehandlede Tuberculöse. By Fr. Lange-Nielsen. Oslo: Jacob Dybwad. 1931. Pp. 49.

approximately accurate estimate of the value of sanatorium treatment. This study is not a little impaired and rendered to a certain extent academic by the fact that, since the period under review, the treatment patients receive in sanatoriums has undergone far-reaching changes, and sanatorium physicians have learned much before adopting the treatment which is more or less orthodox to-day. Auto-inoculation by exercise under the elusive guidance of the opsonic index has largely been replaced by immobilisation of the lungs by a variety of means and the patient has a much greater chance of benefiting from treatment in the best-managed sanatoriums than he had in the period with which Lange-Nielsen deals.

VITAMIN STANDARDISATION: STANDARD CURVES OF RESPONSE.

THE establishment of international standard materials for the vitamins A, D, B_1, and C, which was so successfully carried out last summer, has received notice in our columns. A further step forward is shown in Dr. J. H. Burn's sixth annual report of the Pharmacological Laboratories which we have just received from the Pharmaceutical Society of Great Britain. Vitamin estimations can only be carried out by means of experiments with animals, and anyone familiar with the wide variation in response of individual animals in tests of this type will understand how difficult it must be to establish any sort of standard of behaviour. Yet this has now been achieved for more than one vitamin. If sufficiently large groups of animals are used, the average values of their reponses to graded doses of the given vitamin tend to arrange themselves into a regular series; accordingly, when dose and response are graphically plotted a curve results which, with suitable qualifications, may be taken to represent a standard curve of response to known amounts of standard vitamin material, against which the vitamin value of unknown substances may be tested. The nutrition department of the Pharmacological Laboratories, of which Miss K. H. Coward, D.Sc., is in charge, has been in the van of this interesting piece of progress, and has constructed standard curves for vitamin A, for vitamin D, and for vitamin C. In the first instance it is the growth response of test animals which has been standardised; in the case of vitamin D it is a particular reaction of the bone by calcification; and in the case of the antiscorbutic vitamin it is a histological change in the teeth of guinea-pigs which has provided the response. Other workers have used the X ray appearance of the bone as the particular form of response selected for standardisation in the case of vitamin D and curves have been constructed both in continental laboratories and in that of the Medical Research Institute at Hampstead. The development is certainly important in bringing vitamins into line with drugs which have to be tested biologically, and further important progress in the same direction is to be anticipated.

PLEURISY AMONG HOSPITAL NURSES.

THE incidence of pleurisy with effusion and erythema nodosum among the nurses in training at an important hospital in one of our dominions caused some anxiety last year. The nurses do a term of duty at a sanatorium, and in the course of their work are also attached to a tuberculosis balcony at the main hospital. The actual percentage affected can hardly be ascertained, since the precise number of women at risk is not available; but it can be estimated approximately from the fact that about 45 probationers enter the hospital and about 25 complete their training, in each year. Among the probationers (about 180 in number) who entered over a period of four years there occurred six cases of pleurisy with effusion. Five out of the six had nursed consumptive patients, and four reported sick between three and 12 months after exposure (one record is incomplete). Most of the girls were country-born, but had attended school in towns of some size. In all cases lymphocytes predominated in the pleural fluid, and in one case tubercle bacilli were found; all underwent sanatorium treatment for some months, with apparently satisfactory results. The incidence was thus something over 3 per cent. among all entering probationers. Records of the incidence of erythema nodosum extend over five years, and thus apply to about 225 women: 10 cases were observed (about 4½ per cent.); 7 of the probationers had completed their tuberculosis nursing, and 6 of these became affected while actually nursing tuberculous patients, sometimes after short periods of exposure—i.e., 13, 12, 10, 8, 7, and 3 weeks. A ward-maid from the sanatorium was admitted to the hospital with the same complaint. In all cases complete recovery occurred and the subsequent health has been good. Whether the figures are so far in excess of the expected rates for pleurisy with effusion and for erythema nodosum that they must be regarded as significant, in the absence of a control group in the same area, is not certain. If the cases of pleurisy with effusion are all presumed to be cases of respiratory tuberculosis, and if they represent the entire incidence of such tuberculosis in the population of nurses, this incidence may not be abnormally high. But that all the cases of respiratory tuberculosis in that population took the form of pleurisy with effusion seems unlikely, though we have no information on this point. A good deal more information than has been supplied to us is required if the incidence is to be regarded as more than suggestive. The exposure to risk in the dominion from which this report comes may differ greatly from that in this country. We trust that a fuller report on the circumstances will be published. The figures are to some extent comparable with those given by Heimbeck in Norway (quoted by Topley and Wilson [1]) who investigated 397 probationer nurses, all of whom were tested with tuberculin. Of these 43, or just over 10 per cent., suffered from tuberculosis (including erythema nodosum) within three and a half years. About half the girls gave positive and the rest negative tuberculin reactions on joining, and it is noteworthy that 40 out of the 43 cases of infection were among the negative reactors.

THE ORGANISATION OF RESUSCITATION MEASURES.

AN article under the above title [2] comes as an interesting complement to the paper read at the last meeting of the British Association by Sir Francis Shipway, an abstract of which appeared in our own columns.[3] The American contribution relates laboratory experiences only, but its authors seek to draw useful conclusions for application in the case of human beings. They say that "since clinical application was the goal of the

[1] Topley and Wilson: Principles of Bacteriology and Immunity, 1930, p. 834.
[2] Amer. Jour. Med. Sci., February, 1932.
[3] THE LANCET, 1931, ii., 796.

research, a definite, rigid procedure was developed; a procedure which in our hands resuscitated 82 per cent. of our 52 cats, and 52 per cent. of our 29 dogs." The order of treatment which was found most reliable in resuscitating animals killed by ether, chloroform, or electric shock is summarised as follows: "Place the animal immediately in shock position. Begin artificial respiration by manual compression of thorax. . . . Apply abdominal binder. Expose and cannulize femoral vein, and inject epinephrin into femoral vein and wash it to the heart by a small amount of glucose." There is no mention in the experiments of stimulation of the heart by puncture of an auricle, a method that was shown in Shipway's paper to be of much value in human resuscitation, and, on the other hand, injection of a drug (epinephrin) is rated at a value which human experience hitherto has rarely corroborated. This very likely depends on the fact that the effective method of washing the drug to the heart which is readily carried out in the laboratory is less likely to be easily applicable in the circumstance of a human patient collapsed on an operating table. Neither the drugs, nor the instruments, nor a skilled person free to avail himself of them may be present under ordinary conditions. The "shock position," by which we imagine is meant a position in which the head is made the lowest part of the patient, seems to be the primary need for the collapsed subject, whether animal or human, whatever subsequent measures are also needed.

DANGEROUS DRUGS.

THE results of the Bangkok Conference on opium smoking in the Far East have engaged the attention of the recent session of the Council of the League of Nations. The Opium Advisory Committee was requested to prepare a form of annual report to be made by those governments in whose territories opium smoking is sanctioned, such report is to include particulars of measures taken to discourage the practice, and to cure opium addicts, and statistics are to be furnished giving the consumption per head of "prepared" opium by smokers of different nationalities, and current prices paid for licit traffic therein. Mr. Yen, the Chinese representative, explained that his Government took no part in the Bangkok conference which was convened under Article 12 of the Geneva agreement of 1925, to which China was not a signatory. The reason for such abstention was that the agreement gave no definite assurance that the legalised traffic in "prepared" opium would, within a reasonable period, be brought to an end, as contemplated by The Hague opium Convention of 1912. "China," Mr. Yen said, "remained as heretofore bound only by The Hague Convention, of which she was a signatory, and not by agreements, final acts, declarations or other decisions of the Bangkok Conference." He added that China associated herself with the American observer at the Bangkok Conference in willingness to aid all practicable measures towards suppression of the vice of opium smoking while refusing concurrence with those governments which approved a monopoly system and refrained from attempting prohibition. The report of the Egyptian Government's Narcotics Bureau for 1931 indicates the activity displayed under the direction of Russell Pashas as well as the vast extent of the illicit traffic discovered by the Egyptian police. In 1931, 4327 traffickers and 2882 addicts were arrested, and more than 14,000 kilos of contraband narcotics were seized at the customs in addition to 11,649 kilos confiscated inside the country. On Feb. 17th a new Dangerous Drugs Bill was introduced in the House of Lords to amend the previous Acts of 1920 to 1925 in order to give effect to the provisions of the Geneva Convention (No. 2) of 1931 and thereby supplement The Hague Convention of 1912 and the Geneva Convention (No. 1) of 1925. Numerous additions are made to the preparations of opium and coca alkaloids to which the Dangerous Drugs Act 1920 to 1932 will apply in the event of the Bill becoming law.

EXFOLIATION OF THE LENS CAPSULE.

IT has recently been established that chronic glaucoma in old people is sometimes caused by a degenerative change primarily affecting the anterior capsule of the crystalline lens. Vogt, of Zurich, first drew attention to the condition in 1925 as the result of his observations with the then recently introduced slit-lamp. Other observers, both in his own clinic and elsewhere, followed him, and now Dr. Mohamed Sobhy Bey, of the Cairo Ophthalmological School, publishes a paper [1] on the subject. It appears that in certain cases in old people fluffy whity-blue masses are observed adherent to the pupillary border of the iris or loose in the anterior chamber. These were connected by Vogt with certain changes on the anterior surface of the lens only visible under strong illumination. The changes consist in a faintly opaque central disc and a more peripheral ring of finely granular opacity not continuous with the aforementioned disc but connected with it by faint radial lines. Nine out of the 12 cases observed by Vogt were glaucomatous, and he put forward the hypothesis on clinical grounds that the observed deposits were not inflammatory but degenerated portions of the lens capsule which when they are present in the anterior chamber are apt to produce glaucoma by collecting in the angle and blocking it in the same way that the inflammatory deposits of cyclitis do. During the last six years a certain number of cases showing Vogt's syndrome have been published both from his own clinic and by observers elsewhere, but the subject is somewhat new to English readers. Dr. Sobhy, who was himself a worker in Vogt's clinic at Zurich, has collected over 20 cases seen either by himself or by others of the Egyptian ophthalmic school. He publishes pathological sections of two eyes excised for glaucoma which show the conditions to be just as Vogt described them. It is noteworthy that in one of them although the eye was excised for glaucoma the optic disc showed no typical glaucoma cup. Exfoliation of the anterior capsule appears to be not very rare in old people—17 per 1000 of those over 60, according to the figures of the Zurich Eye Clinic. Of these a considerable number, though by no means all, are affected with glaucoma. It must therefore be recognised as a true occasional factor in causing that disease.

CINEMA WELFARE.

THE national conference that was held at the University of Birmingham on Feb. 27th, under the chairmanship of Sir Charles Grant Robertson, passed a resolution calling on the Home Secretary for a comprehensive inquiry into the arrangements by which films are licensed for public exhibition. In a brief report in our issue of last week (p. 547) the support given to this resolution by Lady Barrett,

[1] Bull. Ophthalmol. Soc. of Egypt, 1931; Brit. Jour. Ophthalmol., February, 1932, p. 65.

Dr. W. A. Potts, and other medical speakers was duly noted. The conference was convened by the Birmingham Cinema Inquiry Committee, which came into being about April, 1930, owing to dissatisfaction (to use a mild expression) with the prevalent type of film, and particularly with the baneful effect of that type on children and adolescents. The promoters of the Birmingham movement maintain that this great instrument which modern science has given to the world can be, indeed is bound to be, a tremendous and inexhaustible source of recreation and education, and for that reason they are determined to persist in their endeavour until its abuses and dangers have been extirpated. Members of the committee have made it part of their work to investigate the influence of the cinema upon children themselves. The picture-houses which the children chiefly frequent were attended regularly for a period of nine months by investigators who sat with the children, talked with them, and watched closely the effects of films upon them. Their results were embodied in a report of great interest issued early last summer.[1] We understand that the general feeling at the conference was that similar inquiries should be undertaken in other centres outside Birmingham. Dame Ethel Shakespear suggested that the conference should appoint seven of its members to act as a standing committee with powers to coöpt others, but a subsequent proposal made by the National Council for Mental Hygiene appeared to be more acceptable to the delegates present. This proposal was that each centre should create its own local committee, and that a national committee should be formed representative of the several local committees. If the proposal matures we should like these bodies to be known as Cinema Welfare Committees, with a constructive rather than a merely destructive outlook.

THE ROYAL SOCIETY

THIS year, for the first time, the Council of the Royal Society has been charged to recommend 17 instead of 15 candidates for election; the great increase in the range of scientific effort throughout the Empire more than justifies the innovation. Among those recommended our readers would be especially gratified to observe the following names: Dr. J. B. Orr, the director of the Rowett Institute, Aberdeen, who has carried out important researches on protein metabolism, on respiration, and on the influence of vitamins and mineral constituents upon normal metabolism and disease; Dr. Warrington Yorke, professor of tropical medicine at the University of Liverpool, is distinguished for his researches on trypanosomiasis and its transmission, and on hæmoglobinuria; Dr. Davidson Black, professor of anatomy at the Union Medical College, Peking, is distinguished for his researches in comparative neurology; Dr. F. R. Miller, professor of physiology at the University of Western Ontario, has also devoted himself particularly to the study of the nervous system; Prof. F. C. Bartlett holds the chair of experimental psychology at Cambridge, and his publications embody much original research in this comparatively new field; and Mr. J. B. S. Haldane, Sir William Dunn reader in biochemistry at Cambridge, has contributed to our knowledge of acid-base equilibrium in man, and his work has had important bearings on therapeutics. Among others less directly concerned with medicine we have to welcome the names of Mr. F. E. Fritsch, D.Sc., professor of botany at the University of London, who is the principal British authority on the fresh-water algæ; Prof. J. A. Gray, who is the Chown research professor of physics at Queen's University, Kingston, Ontario, who has made important advances in the study of radioactivity; Mr. R. D. Hartree, Ph.D., who holds the chair of applied mathematics in the University of Manchester; Mr. Karl Jordan, Ph.D., director of the Zoological Museum at Tring, whose work is mainly on the taxonomy and anatomy of insects; Mr. J. L. Simonsen, D.Sc., who holds the chair of chemistry in the University College of North Wales; Mr. Thomas Smith, head of the optics section of the National Physical Laboratory; Prof. H. W. Turnbull (St. Andrews), who is distinguished in mathematical research; Mr. F. W. Carter, Sc.D., who has materially advanced the foundations of electrical engineering; Mr. W. G. Fearnsides, Sorby professor of geology at the University of Sheffield; Sir Basil Mott, President of the Institution of Civil Engineers; and Mr. H. S. Taylor, D.Sc., professor of physical chemistry, Princeton University, U.S.A.

[1] See THE LANCET, 1931, i., 1409.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 27TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 73 (last week 72); scarlet fever, 1429; diphtheria, 908; enteric fever, 35; pneumonia, 2158; puerperal fever, 39; puerperal pyrexia, 121; cerebro-spinal fever, 62; acute poliomyelitis, 7; acute polioencephalitis, 1; encephalitis lethargica, 17; continued fever, 1; dysentery, 44; ophthalmia neonatorum, 97. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 1st–2nd was as follows: Small-pox, 116 under treatment, 2 under observation (last week 129 and 10 respectively); scarlet fever, 1270; diphtheria, 1544; enteric fever, 13; measles, 1540; whooping-cough, 355; puerperal fever, 21 (plus 10 babies); encephalitis lethargica, 226; poliomyelitis, 3; "other diseases," 210. At St. Margaret's Hospital there were 11 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox or enteric fever, 64 (20) from measles, 9 (2) from scarlet fever, 48 (8) from whooping-cough, 44 (8) from diphtheria, 53 (13) from diarrhœa and enteritis under two years, and 324 (47) from influenza. The figures in parentheses are those for London itself.

The reported deaths from influenza have not risen further. Of the great towns Sheffield stands highest with 18 deaths, followed by Leicester with 15, Bristol with 12, Birmingham and Great Yarmouth each with 11, Bradford and Northampton each with 10. The total deaths for the year from influenza so far amount to 2656, compared with 2625 for the corresponding period of 1931. Manchester again reported 6 deaths from measles, Dagenham 4. Whooping-cough claimed 8 victims in Liverpool, 7 in Birmingham. Liverpool reported 8 deaths from diphtheria, Salford 3.

The number of stillbirths notified during the week was 307 (corresponding to a rate of 45 per 1000 births), including 54 in London.

CHRISTIE HOSPITAL, MANCHESTER.—The funds of the Christie Hospital (cancer pavilion an home), Manchester, have been depleted by £45,000, the cost of the site and the erection of the new hospital at Withington. By the time the buildings are completed not more than £40,000 of endowment will remain; the investment income will thus be reduced from over £6000 to barely £2000. Since the new hospital will have 104 beds, more than treble the present accommodation, a much larger income will be needed, and an appeal is being made for at least £150,000.

SPECIAL ARTICLES

THE COASTAL HEALTH RESORT:

ITS VALUE AND DEVELOPMENT.

AT Hastings last week-end the sun shone brightly at the foundation of the first sectional branch of the new British Health Resorts Association. The founders took the opportunity to discuss the present and future use of the British coast in its relation to health and recreation, and a great variety of opinions found expression.

Medical Aspects.

Dr. W. G. WILLOUGHBY (medical officer of health for Eastbourne and President of the British Medical Association) took the chair at the first meeting. It was true, he said, that one and a half to two hours more sunshine could be enjoyed daily on the Riviera, but the climate of the southern English resorts was much more equable, and to invalids this was very often an important advantage. Like many subsequent speakers, he felt that far too little systematic work had been done on the reactions of the body to a sojourn at the seaside, and that too little information was available to profession and public on the particular uses of particular places in this country.

Dr. E. P. POULTON (physician to Guy's Hospital) pointed out that the air in different places had the same composition. But just as patients on hospital balconies ate 50–100 per cent. more than those in the wards, so people at the seaside received a metabolic stimulus. It was hard to say how far the increase of resistance of children at a place like Hayling Island was due to sunshine, and how far it was due to cooling of the skin. It had been noted that at the seaside the temperature of the skin tended to fall, whereas the temperature of the feet rose—a sign of improvement in circulation. The children in question had come from crowded cities and he could not say that the same thing did not happen when they were sent to the countryside inland. At a place like Hastings, however, visitors might have the benefit of sea-bathing, not only in summer, but also, in the warm sea-water swimming-bath, throughout the winter.

RESPIRATORY DISEASE.

Dr. R. A. YOUNG (physician to Middlesex Hospital) regretted that even the medical profession knew so little about climatology. It was strange, he said, that only during the last century people came to understand the health-giving properties of change to mountains, moors, and coasts—previously condemned as bleak and dour and deserted. Now, however, these properties were appreciated in almost every country, especially perhaps on the Continent in Holland and France. The marine resorts could, he thought, play a big part in preventing chronicity of catarrhal and chest affections (to which his remarks were confined). After illness of the "influenzal" group a few days' residence at the seaside was capable of restoring vigour and activity, and perhaps even more important was its value in clearing up residual cough. Cough was a symptom apt to recur year after year in winter, and its summer intermission often grew shorter and shorter until chronic bronchitis was continuous throughout the seasons. The sequence could sometimes be broken by spending two or three winters at the coast, preferably arriving at a time when it was still possible to spend much of the day out of doors. Emphysema was also helped by staying at the seaside, but asthma presented a more individual and local problem which needed local investigation. It was often said that the tuberculous should not go to the sea, and it was true perhaps that they should not live at sea-level. But many of the most efficient sanatoriums were on the coast, and great benefit could often be derived at the seaside by patients who would not enter sanatoriums or had been discharged from them, and also by those with tuberculous pleurisy for whom institutional life was often unnecessary. More accommodation should be available for such cases, and to this end the unreasonable fear of contracting infection from the tuberculous should be broken down. Much remained to be learnt about the complex effects of climate, said Dr. Young in conclusion, and there was room for experiment at coastal resorts with such methods as inhalation therapy and compressed air-baths like the one at Brompton Hospital which had proved useful in emphysema and other conditions, yet remained unique, he believed, in England. Doctors at coastal resorts must pool their experience and tell their colleagues elsewhere what patients to send and what patients *not* to send. To send unsuitable cases was bad for the patient, bad for the doctor sending them, and bad for the health resort.

CHILDREN.

Dr. LEONARD FINDLAY (physician to the East London Hospital for Children) said that his investigations with the late Prof. Noël Paton had demonstrated the immense importance of environment in the development of children, and also the superiority of country over town. To some extent the difference was due to better maternal care in rural districts, but he had no doubt that fresh air and sunlight played the most important part. These were found at their best on the coast, where the air came in fresh and uncontaminated from the sea. Here the body was readily trained to react to varying conditions, while (as for the mind) there was no place where a child could be so easily entertained—on a playground thoroughly cleansed twice daily. There were opportunities, moreover, for the best form of physical exercise. This was always a bit of a problem in childhood, because its value depended on the vigour with which it was performed, and there must therefore be interest in the movements themselves or the result of their performance. Swimming was ideal, and it should be possible, with warmed and sheltered water, to provide for it throughout the year. For the convalescent, with his lessened power of heat production, there must be sunny playgrounds guarded from the wind—and where better than on the south coast, at the very doors of the largest section of the population of these islands? A stay at the seaside should benefit children convalescing from pulmonary infections and nephritis, and also many with active disease when this was not associated with too great prostration. With tuberculosis of bones or joints, or rheumatism, as good results could be obtained in this country as anywhere—provided sufficient time was allowed for treatment. The doctor must demand one, two, or three years, for often the degree of success varied with the length of treatment. Usually special accommodation was required, but in the less severe cases much could be done with spinal carriages. Room and protection should be found for these on the sea-front, and easy paths should be available for them. The fear of infection of other children was

practically baseless, and the public must learn that there was no danger in using a health resort both for the sick and healthy.

NERVOUS DISORDER.

Dr. WILFRED HARRIS (physician for nervous diseases, St. Mary's Hospital) said that victims of worry were usually best treated in an environment totally different from that of their homes. Some should be sent far away, but the large majority could be looked after most satisfactorily in this country. The south coast was a valuable terrain for these cases. An important advantage was the possibility of easy coöperation with local hospitals and medical men, which avoided the cross-purposes and difficulties that often arose abroad. A further advantage was that the journey was short, without risk of infection in Purple Train or Diamond Aeroplane. But if the best use was to be made of the opportunities a good deal of organisation was necessary. Much had been done for instance at Hastings, but he would like to see further development of the medical baths, together with provision of a solarium and manipulative treatment for wasted muscles. Among the therapeutic agents which might be useful in nervous disorder Dr. Harris included ice-rinks, winter-gardens, dancing-floors, golf-courses, and "mild gambling." He thought it would be hard for English resorts to compete with those abroad unless the present interferences with personal liberty were somewhat relaxed.

Dr. Harris disagreed with Dr. Poulton's statement that air everywhere had the same composition, and Dr. Poulton qualified it by explaining that while the proportion of oxygen was everywhere about 20·93 per cent., what was more important was its partial pressure, which varied with moisture, barometric pressure, and temperature.

LOCAL OBSERVATIONS.

Dr. G. R. BRUCE (M.O.H. for Hastings) said that each year 7000 or 8000 people passed through the 25 or 30 convalescent homes in the town. Experience at the two tuberculosis hospitals, Eversfield and Fairlight, showed that early tubercle did extremely well in the locality, while cases in private nursing homes and rooms could have excellent medical care. Among conditions successfully treated at Hastings he mentioned especially catarrhal infections, asthma, nervous debility and dyspepsia, and post-operative convalescence. Hitherto the benefits of convalescent homes and the like had been mainly offered to the working classes, but the British Health Resorts Association wanted to extend them to the middle and professional classes by making available in hotels and lodging houses the accommodation and diets suited to invalids.

Dr. HILL JOSEPH said he had been 34 years at Bexhill, and could recommend it for cases of insomnia, Graves's disease, surgical tuberculosis, very early phthisis, chronic bronchitis, anæmia, and cardiac disease when not too advanced. But it was no use sending a person to the seaside unless he could stand some exposure to wind.

Dr. PERCY LEWIS, of Folkestone, said that all the towns in the area had the advantage of shelter from east and north winds. He pleaded for closer study of physiological reactions at the seaside on the lines of Häberlin's investigations at Wyk-auf-Föhr.[1] Just as a plant might wither on sudden removal from the conservatory, so delicate children might easily be the worse for sudden exposure at the seaside, with more food, excitement, and exercise, and a longer day. Acclimatisation at Folkestone took about a month, but at the schools it was found that during the first year the children always relapsed in the holidays. It was best to arrive at the seaside school at the beginning of the summer term.

Dr. J. R. DINGLEY (medical superintendent of Robertsbridge Sanatorium) pointed out that some patients required stimulation and others shelter. Children suffering from undernourishment and overclothing usually flourished when their clothes were removed; on the other hand, elderly people with bronchitis and asthma also did very well in the locality if they took reasonable precautions. This was essential, for worse than to send unsuitable cases to the seaside was to send them to a doctor who would not give the necessary supervision. In chronic tuberculosis the place of treatment was not so important as the discipline.

What the Visitor Wants.

"You can't get people to go to places where they won't be amused and interested," said Lieut.-Colonel R. H. ELLIOT, F.R.C.S. (chairman of the executive committee of the Association). "They won't go; they won't stay; and if they do stay they'll never come back." They did not ask for haunts of vice or for gambling-halls, but they did want reasonable amusement. It was a great pity that the health resorts should not encourage their visitors' interest in the archæology and bird life around them—to give but two examples.

Lord MESTON (chairman of council of the Association), who presided over the second session of the conference, spoke of the elaborate organisation which looked after patients going to foreign resorts; they were cared for from the moment they started, and were made to feel that someone was in charge of them. In this country, however, "having made up your mind that you're going to any particular watering-place, you've got to fight your way to it, fight your way into it, and fight your way to a cure."

Sir STCLAIR THOMSON touched on the same point in his speech at the banquet given by the town of Hastings on Friday night. "Non curatur quis curat," he said; you cannot be cured if you are worrying about your health. The basis of French civilisation was good food and good manners, and even in small French hotels one would often find central heating and hot water in every room. The English coast needed to follow this example so that the visitor could always be warm and comfortable and well fed.

Mr. R. C. VAUGHAN, describing hotels as "the heart of every holiday," said that in England they were rapidly improving. At a census as long ago as April, 1930, there were over 500 country hotels with hot and cold water in every bedroom. The real trouble in maintaining good accommodation at the seaside was the shortness of the season, and he hoped the Association would prove that nearly every coastal town was healthy nearly all the year. Municipalities forced up hotel prices by levying heavy rates, and at Bath the hotel managers complained that visitors were discouraged by high medical fees! As for Dora, would it not be possible to have a lighter touch on our sunny seashores? "Can't we allow them to be just a little gay?"

Mr. L. A. DE L. MEREDITH, speaking at the banquet, said that the Travel Association, of which he is secretary, would urge fulfilment of the Licensing

[1] Brit. Med. Jour., 1931, ii., 331, 348; see THE LANCET, 1931, ii., 37.

Commission's recommendation that there should be a separate licence for hotels and restaurants as opposed to public-houses.

Mr. CLOUGH WILLIAMS-ELLIS, F.R.I.B.A., gave an ecstatic account of the ideal seaside pavilion and the ideal wet day to be spent in it. Combining the pantheon of the gods of gaiety with what the Russians would call a "home of pleasure and culture," the building offered all possible amenities amiably sheltered under one hospitable roof, and its master of ceremonies was an ex-ambassador who had lost his job through devoting his despatches to reports of galas and fêtes. From the planetarium to the municipal creche Mr. Williams-Ellis outdistanced the Arabian Nights, and he was certainly right in saying that the first town to put up his pavilion would have many visitors.

Mr. MARSHALL SISSON, A.R.I.B.A., showed pictures of what had already been attempted in this direction, chiefly abroad, and also showed his own design for a seaside recreational centre.

The British Health Resorts Association.

Dr. WILLOUGHBY said that no existing organisation represented the medical point of view. The spas had set a good example in collating and systematising the information at their disposal. There was no wish to decry the value of foreign resorts, of which all were aware, but it was probable that the value of our own watering-places had hitherto been understated.

Lord MESTON said that at the present time there was one export for which there was little or no justification—namely, the export of our own people and money. Was it true, he asked, that other countries had better facilities for cultivating health? This was the question to which the Association set itself to give a negative reply.

Colonel ELLIOT said that the movement had for the first time the unanimous backing of the medical profession, and this could only be retained if it was free from commercialism. He did not know where the movement would lead, but the motto all through would be "Britain first." For the present the British Health Resorts Association was concentrating on the coasts, "but if the spas think we can help them there is nothing we should like better."

Dr. FORTESCUE FOX (chairman of the medical advisory committee) expressed his interest from the purely medical point of view. No organisation had addressed itself in a serious and orderly way to the science of health resorts, and he had reluctantly come to the conclusion that they had gone as far as they could on an individual basis. The problem was a national one to be tackled in a coöperative spirit, and the help of any other organisation would be welcomed. In such a body efficiency must ultimately depend on the peripheral nervous system—the sense-organs and end-organs—and he appealed for the assistance of medical men at the coast.

Resolutions were passed providing for the establishment of a south-eastern region (southern section) branch of the Association, and a local council for Hastings, both medical and lay, was nominated as one of the constituent parts.

The Conference.

Throughout the week-end the conference received the greatest possible hospitality from the local municipalities, hotels, hospitals, and medical men. The Mayor of Hastings welcomed the members at a banquet in the Queen's Hotel on Friday night, and threw open the resources of the town to the visitors. On Sunday three of the leading hotels of Eastbourne entertained 120 guests at luncheon at the Grand Hotel, where speeches were made, among others, by the Mayor (Councillor Lachlan MacLachlan) the medical officer of health (Dr. Willoughby), and Prof. J. D. Stanley, of Birmingham. Here, too, Sir StClair Thomson gave the second of two speeches which will long be remembered by those who heard them. Finally, at Bexhill, on Sunday afternoon, the Mayor (Mrs. C. I. Meads) gave a tea-party in the Granville Hotel, and gracefully provided a christening cake for the Association.

THE LANCET COMMISSION ON NURSING.

(*Concluded from p. 534.*)

Collected Recommendations.

THE recommendations contained in the Final Report,[1] which were signed by all the Commissioners, are as follows:

THE GAP.

I. Conditions of service in the nursing profession should be altered in such a way as to attract a far larger proportion of those girls who in any case will stay at school till they are 18.

II. An extensive trial should be made of combined scholarship and maintenance schemes throughout the country for girls of 16 upwards, with possible extension of such schemes to girls of 14. (See para. 71.) These girls should be chosen, not solely on examination results, but taking into consideration other factors, such as the record and interests of the girl, and probable suitability for nursing. These schemes would be rendered more effective by periodical visits of parties of school-girls to hospitals in their neighbourhood. Such visits would awaken their interest and encourage them to apply, where necessary, for maintenance grants, which could be allocated in accordance with the principles set out in proposition (2) in para. 93.

III. The curriculum in these scholarship courses should be general rather than special until the girl has reached 16 or 17, and after 17 anatomy, physiology, and hygiene could be introduced in direct preparation for the first part of a divided Preliminary State examination.

IV. Encouragement should be given to girls who have left school and are occupied in shops or offices during the day to study anatomy, physiology, and hygiene in evening classes in polytechnics, technical schools, and evening institutes, and to take the proposed Part I. of the Preliminary State examination. The same classes could be attended by girls over 17 who are working in various departments of hospitals or in convalescent homes, and possibly by first year nurses at Affiliated, Associated, or Reciprocal hospitals.

COST OF TRAINING.

V. Hospitals should recognise that the nurses are paying indirectly, if not directly, for their training, and that the onus rests on the hospitals to provide good facilities for such training, including expert instruction during hours on duty. To this end a

[1] The Report may be obtained from THE LANCET Office, 7, Adam-street, Adelphi, W.C.2, for 2*s.* 6*d.*, post free 2*s.* 9*d.*, or through any bookseller.

ward sister who has to train successive batches of students should be given extra remuneration, and some relief from other duties, for teaching in the wards. (See para. 132.)

VI. Neither a maximum nor a minimum standard of payment to probationers is recommended in the present condition of shortage. The policy most likely to attract suitable candidates is that of offering low salaries to probationers and increasing the remuneration of the trained staff.

VII. As an experiment, certain hospitals which are known to give good training should advertise for probationers without offering any remuneration, but offering six weeks' holiday a year and two short periods of study leave (one week each) during the period of training. Scholarships could be given to ensure the supply of sufficient candidates until the scheme became well known.

VIII. The professional education of nurses should be encouraged by the provision of funds expressly allocated for the purpose—e.g., endowments and State subsidies.

SALARIES OF TRAINED NURSES IN HOSPITALS.

IX. *Staff Nurses.*—While the minimum scale of salary set out by the College of Nursing is adequate at important hospitals, considering that the post is a "learning" one, payment on this scale is unlikely to attract staff nurses to small, outlying, or special hospitals. We advise these hospitals to offer initial salaries between £65 and £80, varying with the experience and amenities provided.

X. *Ward Sisters.*—The minimum salary in hospitals not approved as training schools should be £80, rising to £120. The minimum salary for ward sisters in hospitals approved as partial training schools should be £90, rising to £150. The minimum salary for ward sisters in hospitals approved as complete training schools should be £100, rising after eight years to £160.

If the existing system is adjusted on these lines, we suggest that £10 of the ward sister's salary in approved training schools should be regarded as a fee for teaching.

XI. *Non-Resident Posts.*—The inclusive salary and emoluments offered to non-resident sisters should be of not less value than £250 a year—College of Nursing minimum scale for non-resident posts.

XII. *Higher Posts.*—We recommend the universal adoption of the College of Nursing scale of minimum salaries for posts higher than that of ward sister. This scale has already been adopted by many hospital authorities. In the higher administrative posts the responsibilities of the officer increase with the size of the hospital and the allocation of minimum salaries on the basis of the number of occupied beds is equitable.

SALARIES OF DISTRICT NURSES.

XIII. The College of Nursing minimum scale for resident district nurses (£85 to £120) should be adopted by District Nursing Associations, and if an all-inclusive salary is offered, it should be a minimum of £230, rising to £250 after a short term of service.

SUPERANNUATION.

XIV. All voluntary hospitals, institutions, and associations employing nurses should participate in the Federated Superannuation Scheme for Nurses and Hospital Officers.

XV. Early steps should be taken to secure the interchangeability of pension rights among employees of all Local Authorities, whether they have adopted the Act of 1922 or have a Local Act superannuation scheme, and to make provision for superannuation obligatory on Local Authorities.

XVI. Section 8 of the Local Government and Other Officers' Superannuation Act, 1922, should be extended to apply to nurses migrating between employment under Local Authorities adopting the Act, and employment under any institution or association participating in the Federated Superannuation Scheme for Nurses and Hospital Officers, and to nurses leaving hospital to undertake private nursing.

HOURS OF DUTY.

Day Duty.

XVII. The span of work should not exceed 13 hours.

XVIII. If on one, or at most two days a week the span should be extended, it should not exceed 14½ hours, and the extra time should be compensated for by extra hours off duty.

XIX. At least 1½ hours should be allowed for meals during the span, of which 40 minutes should be allocated to midday dinner.

XX. Not less than three clear hours off duty, independent of meal times, should be allowed during the span every day.

XXI. One free day each week should be allowed.

Night Duty.

XXII. The hours of night duty should not exceed 57 in any week.

XXIII. The span of night duty should not exceed 11 hours, and should be less if possible.

XXIV. If on three nights a week at most the span should be extended to 12 hours, this should be compensated for by a shorter span on the remaining nights.

XXV. If the span is 11 hours or more, 1½ hours in all should be allowed off duty for meals and rest.

XXVI. One free night should be provided every week irrespective of three-monthly breaks.

XXVII. No nurse, except a night sister engaged as a permanent officer, should be on night duty for more than three months in any year.

CONDITIONS OF ADMISSION AND SERVICE.

Probationers.

XXVIII. The forms of application sent to candidates and the Hospital Rules supplied to probationers should be revised and modernised where necessary.

XXIX. A clause requiring long notice of withdrawal should be substituted for the threat of fines or other penalties for breach of contract.

XXX. The matron should have power to suspend, but not to dismiss, a probationer pending investigation by a committee of the Board of Management.

XXXI. A separate bedroom should be provided for each nurse; the number of bathrooms should be adequate; and the common rooms and dining-room should be airy and well appointed.

XXXII. A varied and well-cooked diet should be provided. In large institutions an expert in domestic science should be appointed to undertake the housekeeping and supervise the cooking.

XXXIII. The supervision exercised over a probationer in the Nurses' Home should be relaxed; for example, she should not have to retire to bed before 10.30 P.M., or to put out lights half an hour after retirement. The privacy of her bedroom should be respected. Permission to smoke should not be unduly restricted.

XXXIV. The Nurses' Home should be run on informal lines as a hostel under a Warden.

XXXV. Off-duty time should be arranged in advance, so that the probationer knows *at least* a week beforehand between what hours she will be free on a given day.

XXXVI. A probationer on day duty should be free to go out between the time she comes off duty and bedtime without special permission.

XXXVII. Some measure of telephone facilities should be provided, and where possible reception rooms for guests should be available in the Nurses' Home.

XXXVIII. Attendance at meals adjacent to off-duty time should not be compulsory.

XXXIX. Not less than three weeks' annual holiday should be allowed.

Trained Nurses.

L. Sisters and staff nurses should be given improved conditions of service, on lines suggested in paras. 268 and 269.

LI. Where the provision of fresh accommodation for nurses is under consideration, the possibility of giving some of the nurses the alternative of living out by the offer of non-resident allowances should be explored.

LII. Efforts should be made to attract girls with administrative ability into the profession.

LIII. Posts as staff nurse should be reserved for fully trained nurses.

PROFESSIONAL EDUCATION.

XL. The *Preliminary State examination* of the General Nursing Council should be divided into two parts: Part I.—Anatomy, Physiology, and Hygiene; and Part II.—Theory and Practice of Nursing.

XLI. Part I. should as a rule be taken before, but not more than two years before the nurse enters the wards. If a hospital wishes to admit a girl who has not taken Part I., or has failed in Part I., this should not be forbidden, provided that she is not admitted to lectures in medicine and surgery, or to Part II., before she has passed Part I. A girl who had taken Part I. more than two years before she entered hospital might be required to take it again.

XLII. The General Nursing Council should recognise as centres where the lectures for Part I. can be given, any institutions, including secondary schools, where adequate arrangements have been made to give this tuition, and in which the tuition provided is not inferior to that provided at hospitals approved as Affiliated, Associated, or Reciprocal hospitals. The lectures should be given either by a medical man or woman, or by one who holds a university degree in these subjects, or a certificate from one of certain specified physical training colleges.

XLIII. The General Nursing Council should exempt from any subject in Part I. anyone who holds a university degree which includes that subject, or has passed an advanced examination in it—e.g., an Intermediate examination in science.

XLIV. Questions in the *Final State examinations* for all parts of the register should be confined to nursing treatment, and should not involve systematic medicine, surgery, gynæcology, or psychiatry.

XLV. Hospital authorities should assume responsibility for releasing a nurse from duty at least on the day before, as well as on the day of, her final written and oral examinations.

XLVI. Sister tutors should be provided in the proportion of not less than 1 to every 60 nurses in training.

XLVII. Sister tutors should not be required to undertake any duties other than those connected with education.

RECOGNITION OF PREVIOUS TRAINING.

XLVIII. The General Nursing Council should empower all hospitals approved as complete training schools giving a three years' course to make an allowance for time spent in any other approved training school, provided satisfactory evidence of such service is produced.

DOMESTIC WORK IN HOSPITALS.

XLIX. A redistribution between nurses and ward-maids of the domestic work in the wards of hospitals is urgently required. We recommend the provision of sufficient ward-maids to relieve nurses of domestic duties not directly concerned with the patient.

STAFFING OF NON-APPROVED HOSPITALS.

LIV. Hospitals which are not approved by the General Nursing Council should not seek to enlist probationers for training, but should be staffed by trained nurses and domestic workers.

TUBERCULOSIS HOSPITALS.

LV. In the Supplementary part of the register containing the names of nurses trained in the nursing of persons suffering from infectious diseases, a special section should be included in which should be placed the names of nurses trained in the nursing of patients suffering from tuberculosis.

LVI. Higher pay, greater amenities, and long holidays should be offered in connexion with work in sanatoriums.

MENTAL HOSPITALS.

LVII. The filling of ward sisters' and higher posts by nurses who have had a general as well as a mental hospital training is desirable. Greater facilities for fully trained mental nurses to take a two years' course in general hospitals are urgently required.

LVIII. The provision of teaching, and accommodation for study, should be adequate; and probationers should be encouraged to undergo progressive training. Hospitals which have sought and obtained approval by the General Nursing Council as training schools should provide teaching for the State examinations.

LIX. Special care should be taken that young, inexperienced probationers do not begin their work in wards where the patients are likely to be abusive, noisy, or violent.

LX. The stretch of work during which no meal is provided should never be as long as 7 hours.

LXI. Advertisements should show clearly what is the net salary offered at the time of appointment, and nurses in hospital should be furnished on pay-days with a statement showing the gross amount due to them and the deductions which have been made.

The Conclusion to the Report.

In concluding this survey it will be well to repeat what was said in opening it—that it has been restricted to a search for causes remediable within the limits of the present system of hospital staffing without fundamental change. Within these limits it has revealed many differences in the existing practice of hospitals. It has revealed inequalities of pay and conditions where duties and responsibilities are not dissimilar; restrictions that are hard to explain except as survivals which have only to be pointed out to be removed; an apparent indifference in some cases to the changes that have taken place in the opportunities outside nursing and the expectations of educated women; and a very general failure to coördinate entry to the nursing profession with the later stages of school life. On the other hand, it has revealed much fruitful experiment; many hospitals

which are faced with no problem because the conditions they offer attract all the nurses they require; a keen interest on the part of the leaders of the profession in the education of probationers; and above all a sense of vocation and a professional pride that have so far prevented the shortage of suitable candidates from lowering at all the standards of nursing in the country.

In our recommendations, we have endeavoured to bring together the lessons of the successful experiments that have been made and to suggest changes that will generalise the best existing practice. We have endeavoured to show how the entry to the profession can be linked up with the general system of girls' education, and to indicate measures that should go far to meet the peculiar difficulties of some of the specialised institutions. It would have been as easy as it would have been useless to take the highest standards of remuneration and conditions of other women's occupations and invite the hospital authorities to outbid them, or to recommend conditions that might attract candidates, but would be quite incompatible with the proper fulfilment of the purpose for which the nursing profession exists. It was impressed upon us by all the witnesses best qualified to speak for the profession that a sense of vocation is essential and that the standards of the profession could not be maintained merely by an economic appeal. This we fully accept, provided that it is understood that an aspirant may properly feel a call, not only to render a personal service to individual patients, but equally to take a part in health propaganda or in the important administrative and social work involved in the running of a hospital.

We have sought to eliminate anomalies, unnecessary hardships, and interferences with personal freedom. If other professions are now open to educated women, and occupations of a less exacting and responsible character offer higher or more immediately economic attractions, the inherent importance and interest of the nursing profession remain undiminished. Its status has been raised by the system of State registration and the more regular provision of education in connexion with training. Our survey has revealed no insuperable difficulties, even without revolutionary change, in the way of overcoming the shortage of suitable candidates, and we offer this Report to the authorities directly concerned and to the public, as a contribution to the solution of the problem presented by this shortage.

MEDICINE AND THE LAW.

Unsuccessful Claim against Surgeon for Negligence.

THE litigation in Tudor *v.* Mein, heard before Mr. Justice McCardie and a special jury on March 2nd and 3rd, illustrates a typical risk of the profession. A surgeon operated upon a child. Four months later, when the patient is in another part of the country, a second operation is found necessary and is performed by another surgeon. The child's parents, convinced that the first surgeon must have been negligent, sue him for damages. After their case has been placed before a jury with full publicity, the defendant gives his own account of the operation and submits himself to cross-examination. He is followed in the witness-box by two other surgeons who negative the idea of negligence. Thereupon the plaintiff's counsel withdraws all allegations unreservedly, and the parents express through him their appreciation of the fact that the original operation saved their child's life. The defendant surgeon, who had been forced to defend his professional reputation against so damaging a charge, then makes an *ex gratiâ* payment in respect of the plaintiff's costs out of what the learned judge calls "a generous goodwill." The judge emphasises the fact that all allegations of negligence are entirely withdrawn and that it is recognised that the defendant is an able and experienced surgeon. Could not this result have been attained without the time and money expended over full-dress legal proceedings, not to mention the anxiety of the defendant and the interference with his work? The issue here was entirely technical; decision depended on expert opinion. Is it not possible to evolve a tribunal which would sift these claims before they reach a jury? If plaintiffs withdraw their actions on hearing what is said by the other side, could not this process take place earlier? In the action against Mr. Mein we were happily spared the spectacle of expert witnesses for the plaintiff violently attacking the reputation of a member of their own profession. It must sometimes happen that, if the expert witnesses on both sides could get together beforehand, a plaintiff might, on fuller information, discontinue proceedings.

The case against Mr. Mein may be briefly summarised. The original operation was for the removal of the appendix. The plaintiff evidently believed that nothing of the sort was done, since at the second operation the appendix was said to have been found complete. The defendant's answer was that, at the original operation, he found "everything was a mass of adhesions." He enlarged the opening and found the tip of the appendix which was gangrenous and perforated. Four and a half inches from the tip he came to where the appendix appeared to attach itself to the large intestine, and he cut it off at that point. The general practitioner and the nurse, both of whom attended the operation, were present in court and ready to say that they saw the appendix which the defendant removed. Sir Charles Gordon-Watson and Mr. Warren Low gave evidence as to the difficulty of finding the actual position of the join of the appendix and the intestine, when there are adhesions. In some cases, said Mr. Low, it was impossible; he did not suppose there was a surgeon who had not at some time been mistaken. This evidence virtually disposed of the claim; the surgeon who performed the second operation had previously agreed that an operator who removed 4½ inches of appendix might well think he had removed the whole.

It remains only to add that, so long as claims of this nature are a risk of practice, it is only prudent to insure against them by joining one of the experienced defence organisations. The defence on this occasion was undertaken by the London and Counties Medical Protection Society, and the defendant's membership must have proved a wise investment.

FINANCES OF THE LONDON HOSPITAL.—In 1931 the income of the London Hospital was £242,153, and the expenditure £250,930, leaving a debit balance of £8777. The expenditure, nevertheless, showed a reduction of £9517, partly due to the greater cheapness of commodities; the income was £4618 greater. The revenues from invested property was £55,241. There were 13,617 in-patients, and 81,389 new out-patients, 1200 of whom were often treated in a day. In recording that the hospital possesses 2 grammes of radium the Governors state that "undoubtedly in certain cases of cancer radium is beneficial." The Viscount Knutsford Remembrance Fund stands at £11,533.

PANEL AND CONTRACT PRACTICE

Emergency Treatment.

WHAT is an emergency? This is a question which panel committees are always discussing when considering claims from practitioners under the emergency treatment scheme with its scale of fees. A patient suddenly falls ill, has a severe pain, or meets with an accident. He (or generally a relative) sends for his panel doctor, who may not happen to be at home. The messenger then, without saying who the patient is or even where he lives, generally flies off to another doctor who attends, gives the necessary treatment, and afterwards claims for remuneration. The insurance committee passes on the claim to the panel committee for consideration and decision. The doctor who has attended also sends a notice to the patient's own doctor, notifying him that he is claiming a fee under the emergency scheme according to the prescribed scale. The panel committee obtains statements of the case from both doctors before arriving at a decision. If the doctor who treated the patient (we may call him the emergency doctor) says the case was urgent, and his description confirms this—e.g., a hæmorrhage—the decision is a simple matter when it comes before the panel service subcommittee of the panel committee. The emergency doctor obtains his fee because the panel doctor was not available, and the money for its payment is deducted from the panel doctor's next cheque.

The first complication occurs when the emergency happens a long way from the patient's own doctor, so that no message can be sent to him, and if it were sent he would be too far away to get there in time to attend without ill-effects to the patient through waiting. Here the panel committee will order the emergency doctor to be paid according to scale, not however from the patient's own doctor's remuneration, but from the general fund, out of which all panel doctors in the area are paid. The next complication is where the emergency occurs in the area of the patient's own doctor, to whom however no message has been sent, treatment being demanded (and obtained) from a nearer doctor. Here the question of whether it is an emergency becomes important. If in the opinion of the committee the case is of such urgency—e.g., hæmorrhage from a cut, or a stroke—that the patient's own doctor could probably not have been obtained without the patient suffering harm through waiting, the emergency doctor will be paid from the general practitioner fund. But if the case was not thought to be of that degree of urgency, no claim at all will be allowed by the panel committee; the emergency doctor has then to obtain payment for his attendance from the insured person. A borderline case would be a speck of grit in the eye. Difficulty arises in this type of case where a practitioner, called by nervous relatives for something thought to be an emergency, to which he is bound under the regulations to attend, has to report to the panel committee that when he arrived there was no emergency, with the result that his claim for a fee is disallowed. He has then to claim from the insured person, often with little probability of being paid at all.

An aggrieved practitioner has the right of appeal to the Minister from the decision of the panel committee. The payment for emergency services is laid down in a scale of fees in the local distribution scheme. One item in the London area is a fee of one guinea for the treatment of a fracture. In a case which came recently before the panel committee a doctor claimed this fee for treating a fractured clavicle. There had been an accident, a pain, a lump in the region of the clavicle. The doctor examined the case, diagnosed a fracture, and treated it as such. He sent in his emergency claim for one guinea. In such cases the emergency doctor can only claim for one attendance; the patient, after the emergency has been treated, returns to his own panel doctor. In this case the patient called to see his own doctor the following day, when examination revealed subluxation of the acromio-clavicular joint without evidence of fracture. The point here that arose was that the doctor diagnosed the case as a fracture and treated it as such, and he therefore claimed a guinea fee. But X ray examination showed no fracture, and under the distribution scheme a guinea could not be paid to a case that was not a fracture, no matter what it was thought to be at the time. After discussion the panel committee decided to allow an emergency fee of 5*s*. for attendance at the surgery, but disallowed the fracture claim.

It should be added that there are several areas where no emergency fees are allowed. Each doctor does the emergency work that comes his way without payment, and in return has his own patients attended to in an emergency without charge.

Disciplinary Action: the Ministry of Health and the General Medical Council.

Last November a letter was sent by the General Medical Council to the Ministry of Health suggesting that it would be helpful if the Council could be officially informed of cases in which the Minister of Health had taken disciplinary action in regard to practitioners whose names appear upon the panel. A reply, dated Feb. 17th, 1932, was received from the Minister to the following effect:—

"I am directed by the Minister of Health to say that it is understood that the convenience of the Council will, in the first instance at any rate, be met by arrangements under which they continue as at present to be informed of cases of removal from the medical list under Part VI. of the principal Regulations, and are in addition informed of (1) cases of irregular or lax certification; (2) cases of unprofessional conduct; and (3) cases in which allegations of canvassing or fraud are established or substantially supported.

"The Minister will be glad to enter into arrangements on these lines, and he thinks it will be convenient that in bringing cases other than cases of removal from the medical list to the notice of the Council he should forward to them copies of the following documents: the report of the Subcommittee (normally the Medical Service Subcommittee) of the Insurance Committee by whom the matter will have been investigated in the first instance; the decision of the Insurance Committee on that report; the report of the persons who heard the appeal (if any) against the Committee's decision; the representations (if any) made by the practitioner to the Minister under Article 41 of the principal Regulations; and the Department's letter conveying the Minister's decision either to warn or censure the practitioner, or to take action with a view to the withholding of part of the remuneration otherwise payable to him. In cases of lax certification dealt with under Article 3 of the National Health Insurance (Medical Benefit) Amendment Regulations, 1930, the report of the Panel Committee will take the place of the report of the Medical Service Subcommittee."

Similar arrangements are to be made for the communication to the Council of cases arising in Wales and Scotland. At its meeting on Feb. 22nd the Executive Committee of the Council approved the procedure proposed.

CORRESPONDENCE

TUBERCULOSIS OF CHILDHOOD.

To the Editor of THE LANCET.

SIR,—The interesting letter of Drs. Toussaint and MacIntyre raises the question of the relative value of radiography and tuberculin in the diagnosis of infantile tuberculosis. Their high opinion of the tuberculin test is rightly based on the recent report of the Medical Research Council, but their opinion of radiography is based on obsolete conclusions of a committee of the National Tuberculosis Association of America. The conclusions of this committee were made at a period when there were wide variations in radiographic technique. In the light of recent knowledge these conclusions should be revised as follows :—

"The normal chest.—The normal chest of the child from the roentgenological standpoint is subject to no more variations than the normal hand.

"Hilum shadow.—The hilum shadow in health is cast by the pulmonary artery only. Normal glands, bronchi, and veins play no part in the formation of this shadow. Glands only become visible when caseating or grossly enlarged, and are then easily identified as such.

"Calcified nodes.—Calcified nodes at the root of the lung, irrespective of signs of lung disease, are definite evidence of old tuberculosis in the bronchial glands. There is no inflammatory condition except tuberculosis which causes dense calcification of the bronchial glands."

Drs. Toussaint and MacIntyre consider two of Dr. Fletcher's cases to be "incompletely resolved pneumonic conditions," and then state that "such cases are far from rare in tuberculosis dispensaries with adequate X ray facilities." In other words, there is a form of pneumonia in children which can only be diagnosed by radiography, and which is not acute inasmuch as the sufferers from it are brought to tuberculosis dispensaries. A considerable number of these "pneumonic conditions" in children have been observed in the Royal Chest Hospital, and there are certain features common to them all. The children are never acutely ill, and often have no pyrexia. The pneumonic processes observed by serial radiographs slowly resolve or calcify. What organism other than the tubercle bacillus produces a chronic and often symptomless pneumonia which can heal by calcification ?

I am, Sir, yours faithfully,

PETER KERLEY.

Weymouth-street, W., March 5th, 1932.

BLOOD TRANSFUSION IN PURPURA.

To the Editor of THE LANCET.

SIR,—In their article in your last issue (p. 509) upon Hæmorrhagic Purpura following Scarlet Fever, Dr. A. G. Gibson and Dr. F. G. Hobson state that transfusion of blood was considered in the second case, but, in view of the fact that the patient's serum agglutinated her own red cells and those of all possible donors, this procedure was, in consultation with Dr. Letheby Tidy, deemed to be impossible. May I recall two cases reported in your own columns (1931, ii., 399) by Dr. W. Stewart and myself in which transfusions of blood were given to patients in this hospital, both of whose sera agglutinated their own and all other red cells against which they were tested. Dr. S. C. Dyke demonstrated this phenomenon to be dependant upon temperature and to bear no relationship to blood group, and on his advice transfusion was performed in both cases with group-compatible blood. In both instances the transfusion was followed by a sharp reaction which was however readily controlled by adrenalin and morphia.

I am, Sir, yours faithfully,

EILEEN E. HARVEY, M.R.C.S. Eng.,
Assistant Pathologist, the Royal Hospital,
March 7th, 1932. Wolverhampton.

ANAPHYLAXIS FROM BEE-STINGS.

To the Editor of THE LANCET.

SIR,—That repeated bee-stings lead to an immunity from ill-effects is exemplified by seasoned apiarists. As yet however we have no adequate explanation for the sudden loss of this immunity which has been known to occur in even veteran bee-keepers, when without warning they have suddenly been seized with acute symptoms following a few stings which would ordinarily occasion them not a moment's notice. Simmins [1] states that the beginner at bee-keeping occasionally "is so severely punished, even by a solitary sting, that he may begin to think seriously of giving up. In a few instances the difficulty is never overcome ; but, as a rule, the apiarist becomes in time, not only used to, but quite careless of bee-stings." The actual prick however always remains painful. Herrod-Hempsall [2] mentions that "there are a few people who cannot keep bees on account of the effect of the sting upon them. In some cases the poison causes temporary distress in the form of asthma, in others a state of coma occurs, while yet again a fainting fit may result." The Roots [3] describe the occurrence of a rash of red blotches following stings, accompanied by fever ; and they cite an interesting case of a boy originally severely affected by stings who was cured of ill-effects by a course of graduated numbers of stings at intervals throughout a year.

As an example of the severe reaction which may occur, the following description by a medical friend seems to me worthy of being placed on record. Dr. X has been interested in the keeping of bees for the last two years. In August, 1930, he was "stung up" whilst, perhaps from clumsiness and inexperience, he irritated the hive to the point of frenzy. Although well protected by bee-veil and gloves, he received over 20 stings which resulted in local and systemic reactions, so that after a mild rigor he had to retire to bed with headache, diarrhœa, and general disfigurement. Subsequent to this, although conscious that the bees loved him not, he remained comparatively unmolested till June 7th, 1931. On that occasion whilst, with due preparation, he was engaged in a simple operation on his hive, he was stung on the chin and forearm by three angry bees. It was noted that the stings were particularly painful. Within ten minutes he experienced a cramping pain over the præcordial region and a curious sinking feeling radiating down the thoracic aorta. At the same time the pleasant surroundings, including the hive itself, appeared to revolve round and round in kaleidoscopic confusion. Enough consciousness remained to enable him to stagger some 40 yards from the hive when he collapsed on the garden path and there he remained unconscious for 20 minutes.

[1] Simmins, S. : A Modern Bee Farm, 1928.
[2] Herrod-Hempsall, W. : Bee-keeping New and Old, vol. i., 1930.
[3] Root, A. I. and E. R. : A.B.C. and X.Y.Z. of Bee Culture, 1923, British Bee Jour., vol. xviii., p. 425, and vol. xxii., p. 55.

A typical reaction followed with headache, diarrhœa, and vomiting with rise of temperature to 100° F. for 12 hours. The local reactions of the stings were severe and the swellings on face and hands remained for three days.

Dr. X regards his case as an example of sensitisation to bee-stings which persisted for ten months. After this experience his enthusiasm for bee-keeping was somewhat damped, for had he fallen insensible on the top of the hive and received the full dosage of hundreds of stings the result might have been disastrous. It would be interesting, he thinks, to find out whether other bee-keepers have had a similar experience.

I am, Sir, yours faithfully,

A. L. GREGG.

Porchester-gardens, W., March 5th, 1932.

CHRONIC INFECTIONS OF THE LUNGS.

To the Editor of THE LANCET.

SIR,—The interesting contribution by Dr. P. J. Marett, in your last issue (p. 511) on chronic infections of the lungs by fungi and the importance of the routine mycological examination of sputum to assist in the diagnosis of these infections, whose response to treatment is by no means unfavourable, merits wide recognition. The fungi as ætiological agents in diseases of the respiratory tract have not received the attention which is their due. These pneumonomycoses (moniliasis, blastomycosis, actinomycosis, aspergillosis, &c.) may produce signs, symptoms, and even lung changes which may closely simulate pulmonary tuberculosis. Two such cases of primary monilia infection of the lung were shown by me at the Clinical Section of the Royal Society of Medicine last year. As Dr. Marett points out, the mere presence of monilia in the sputum does not indicate a primary fungous infection. These fungi are, in point of fact, not uncommonly secondary. There can be little doubt that a catarrho-pyogenic infection due to any other organism, including monilia, superimposed upon a case of pulmonary tuberculosis does tend to aggravate the tuberculous process. Treatment of this superimposed infection is often most striking, especially where this is due to a fungus upon which, as is well known, iodide of potassium has a selective action. Hence examination of the sputum in chronic lung infections should not be limited to tubercle bacilli, but should include examination for other organisms, not excluding the fungi.

I am, Sir, yours faithfully,

Harley-street, W., March 7th, 1932. PHILIP ELLMAN.

EUTHANASIA.

To the Editor of THE LANCET.

SIR,—In your kind review of my brochure on the Legalisation of Voluntary Euthanasia (THE LANCET, March 5th, p. 523) you say:—

"Surely a movement as novel and daring as this has evoked as weighty criticism as it has approbation? If Dr. Millard has received any expressions of adverse opinion at all comparable with the favourable ones he quotes, it would probably help his cause if he were to publish them."

In reply may I say that apart from objections based on religious grounds, such as those quoted in my brochure, I have received remarkably little reasoned criticism—almost none that can be called hostile. One correspondent, whose opinion one is bound to respect, writes:—

"You certainly make out a good case but not, I think, an unanswerable one. It seems to me that you underestimate the natural reluctance of members of the medical profession to assume the responsibility that would fall upon them; nor do I think that the possibilities of crime are eliminated. . . . I should estimate that very few doctors would pronounce any disease incurable until it was a matter only of a short time."

Of helpful criticism—if indeed it can be called criticism—the most important is from a high legal authority in London (owing to his official position he does not wish his name to appear), who has made several sympathetic and friendly suggestions as regards the legal aspect of my Bill. He doubts whether it is really necessary for applications for euthanasia to go before a court of summary jurisdiction, and he rightly points out that such a tribunal would not be the best fitted for the purpose. He thinks that it would be a sufficient safeguard if the "near relatives" had the right of appeal to such a court, which right in practice would probably be very rarely exercised. I am quite prepared to accept this suggestion. This gentleman has been at the trouble of redrafting and amending my Bill, adding the necessary legal definitions, schedule, forms of medical certificates, &c. Thanks to his legal knowledge and special experience in drafting Bills, this new Bill is undoubtedly a much better Bill than mine, and when the time comes for this question to be raised in Parliament the Bill is all ready to be put forward.

Of warm approbation I have received far more than I ever dared to hope or expect. A letter received this morning from the principal of a university college may be cited as an example: "I am intensely interested in your proposals, which I believe in completely." A distinguished member of our profession wrote me the other day: "I am in complete sympathy with your proposals, both on humanitarian and sociological grounds. . . . I wish you every success."—I am, Sir, yours faithfully,

C. KILLICK MILLARD.

Health Department, Grey Friars, Leicester, March 8th, 1932.

RELIEF OF VESICAL IRRITATION.

To the Editor of THE LANCET.

SIR,—The method described in your annotation last week (p. 524) apparently depends upon the use of mineral oil, and is described as a simple one, with claims so striking that it deserves a trial. If you will refer to your own issue of 1924, i., 179, you will find, related by myself, a technique for cystoscopy in the presence of pus and blood in which mineral oil is used as the medium. Experience has amply justified the hopes expressed when the method was first tried out. Bleeding from a papilloma in the bladder can be readily located and easily cauterised by the diathermy electrode. Mr. Canny Ryall, in his book "Operative Cystoscopy," states that in this way he has been able to deal with hæmorrhage which he could not otherwise have arrested. This is fully borne out by my experience.

Support can also be given to the statement that vesical irritation after cystoscopy and diathermy is much less than after ordinary methods. Selection of the grade of paraffin is, however, important, since liquid paraffin of the British Pharmacopœia, however useful in treatment, is too viscous for satisfactory use with the cystoscope. Oils of a low viscosity are much more suitable and easier to use.

I can most strongly recommend the method in indicated cases.—I am, Sir, yours faithfully,

W. E. M. WARDILL.

Newcastle-upon-Tyne, March 7th, 1932.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

THE WHEAT BILL.

IN moving the second reading of the Wheat Bill on March 1st in the House of Commons Sir JOHN GILMOUR (Minister of Agriculture) said that the measure was agreed to by all the interests concerned. The Government did not contemplate that there would be a permanent increase in the price of bread as a result of this Bill, and they were satisfied that, with a maximum limit of 6,000,000 qrs., there was no danger that a permanent general increase in bread prices would result. It was, he said, only when flour and bread were cheap that the quota payment on flour was really noticeable. To-day United Kingdom consumers of flour and bread got them at lower prices than any other country in the world, except possibly Belgium.

Dr. SALTER, who moved the rejection of the Bill, said that it was the bread consumer who was to pay the price. Bread was still the cheapest all-round food, and the poorer the family the more bread they consumed. There were, he said, hundreds of thousands of families in this country whose bread bills were over 10*s.* per week, and almost all were the very poorest people. He described the policy of the Bill as an attempt to revert to a condition of affairs in English life which had long since passed away and which could never be restored. The motion for rejection was defeated by 428 votes to 55—majority 373—and on March 2nd the Bill was read a second time and committed to a Committee of the whole House.

DANGEROUS DRUGS BILL.

On Wednesday, March 2nd, in the House of Lords, the Dangerous Drugs Bill was read the third time.

LONDON COUNTY COUNCIL BILL:

FOOD INSPECTION PROPOSALS.

In the House of Commons on Thursday, March 3rd, on the motion for the second reading of the London County Council (General Powers) Bill,

TRANSPORT OF EDIBLES

Mr. G. HARVEY moved the rejection of the Bill. He said that two clauses in particular struck him as being unfair to the trading community of London. With regard to Clause 17, within the last day or two a concession had been made by the London County Council. It said:—

"The London County Council is prepared to give an assurance to the following effect in the event of the opposition to this Bill being withdrawn."

That was a passage he did not like. The concession went on:—

"Any by-laws proposed to be made by the Council in pursuance of Clause 17 shall not extend beyond the scope of Section 72 of the Public Health Act, 1925, subject to the inclusion of by-laws to deal with two additional matters, namely: (i) Arrangements to ensure cleanliness, &c., in transport: It would be understood that transport does not include conveyance within the curtilage of the customer's premises. (ii) Power to require in cases in which food is wrapped in paper or other material, such wrapping shall be clean and otherwise reasonably satisfactory."

The Public Health Act, 1925, expressly excluded London, and in proposing to make by-laws in pursuance of this clause the Council met the difficulty of a good many of those who objected in the first instance. But if Section 72 of the Public Health Act, 1925, were made to apply, in his view and those who were advising him Clause 16 would not be necessary at all.

REGISTRATION OF THE SMALL TRADER.

The London County Council stated with regard to Clause 17 that some 60 provincial boroughs had adopted by-laws under the powers given to them by the Public Health Act, 1925. When the Council was asked to give a list of those 60 boroughs the number resolved itself into 17. These were written to, and only three had thought fit to utilise the power to make by-laws. Clause 16 referred to further registration requirements, and Subsection (2) was in the nature of an attempt to browbeat the small trader. The Statutory Rules and Orders, No. 1432, under the Public Health Act referring to meat set out in detail the sanitary arrangements of shops, stores, and other places in which meat was sold, or exposed for sale, and he would have thought that that ample provision would have been sufficient without further attacking traders who were trying to do their best in very difficult conditions. Under Clause 16 all meat shops had to be registered if they dealt in potted, pressed, pickled, or preserved meat, but there was no definition of those commodities in the Bill. He thought that to require a meat shop to be registered when clubs, hotels, and restaurants were exempted was quite unnecessary. The following officers had the right to inspect meat traders' premises—the meat inspector, the sanitary inspector, the medical officer of health, the shops inspector, the inspector of weights and measures, in some cases the factory inspector, the inspector from the Ministry of Labour, the inspector from the Ministry of Health, the inspector under the Food and Drugs Act, and the inspector of juveniles. Now it was proposed to add the sausage-making inspector. (Laughter.) The time was arriving when this over-inspection was becoming the bugbear of all who attempted to carry on any business.

Mr. HERBERT WILLIAMS seconded the motion for rejection. He said none of those who opposed the Bill desired to hinder the London County Council in their splendid and beneficent work, and he appealed to the promoters to give them some reasonable undertaking with respect to Clause 16 similar to that which they had given in the matter of Clause 17.

FURTHER POWERS REQUIRED BY THE L.C.C.

Sir CYRIL COBB said he could give an undertaking that the by-laws which would be drawn up in due course would be drafted under Section 72 of the Public Health Act, 1925. He could not meet, however, the desire of Mr. Harvey and Mr. Williams in regard to Clause 16. The Council must have registration, and must have the necessary powers to see that such registration was effective. Clause 16 dealt with ice-cream and sausages. The Council had registered ice-cream makers since 1928, but they had not previously registered sausage-makers. At present they could do nothing against the ice-cream maker unless he refused to be registered and still went on making ice-cream; in that case they could proceed against him. They could also proceed against him if he poisoned anybody, and information of it was brought to their notice through the medical officer of health. They could not take him off the list of registered ice-cream makers, and could not refuse to register him, even though they knew from the beginning that his premises were uncleanly and insanitary. Therefore, it was necessary for them to have the further powers asked for under the Bill. At present, so far as they were able to deal with sausage-makers at all, they were obliged to fall back on the ordinary regulations of the Ministry of Health regarding food, and on the Public Health Act (London), 1891. Under that Act any medical officer of health, or sanitary inspector, might at all reasonable times enter all premises and inspect and examine any animal intended for the food of man which was exposed for sale or deposited in any place for sale or preparation for sale; also any article, whether solid or liquid, intended for the food of man, and sold, or exposed for sale, or deposited in any place for sale, or preparation for sale. At present they were in a worse position with regard to sausages than with

regard to ice-cream, for they did not know in all cases where the premises were situated in which sausages were made. This was a public health question, and what the Council wanted to do was to protect the food of the people. Therefore they wanted to have the same powers with regard to sausages and preserved meats, &c., as they were now asking for in connexion with ice-cream. The London borough councils and the city corporation were all agreed that Clause 16 was necessary in order to round off their powers for preserving the health of the people. These powers were necessary to keep traders up to the mark.

Mr. LANSBURY said he wished to join with other London Members in saying that these clauses were wanted unanimously by all the representatives of London. Before any regulations existed in regard to these matters the medical officer of health in his area was continually telling him of things which he had no power to interfere with.

ADJUSTMENT OF PUBLIC HEALTH TO LEGITIMATE TRADING.

Sir E. HILTON YOUNG (Minister of Health) said the powers sought for by the London County Council under this Bill were certainly not without precedent, even those conferred by Clause 16, which raised so much contention. He knew of no record of any difficulty or friction or dissension or complaint of injustice in the past. Powers that had been found useful and had given rise to no complaint in provincial cases might well be useful and necessary in the Metropolitan area. In this matter it was necessary to adjust two very substantial interests. The first was that of public health, and he could not help being impressed by what had been said by several speakers in the debate upon the big interests of public health involved in the powers now sought by the London County Council. On the other hand, he had been impressed by the fact that the interests of legitimate trading were also involved, which the House would be concerned to safeguard. The adjustment of those two interests was a matter which needed very careful threshing out by a committee, rather than on second reading. He had come to the conclusion that the House would be well advised not to reject the Bill at that stage, but to consider the general discussion as giving notice to the important interests involved, and to leave it to the committee to adjust those interests later. The Bill contained many things in the interests of the good government of London, and it would be a little out of proportion to reject it as a whole when there was a possibility of adjusting matters in committee.

Mr. CASSELS, speaking as a London Member, said that there was already ample provision in the law of the land to deal with unwholesome food. Why did the London County Council in the interests of public health desire to have such a full and complete inspection of everybody's premises? Traders did not want the whole of their premises continually roamed over by inspectors under various labels. While the House ought to have the interest of public health at heart, they ought to say that the existing law was quite sufficient, even for the London County Council.

Clause 18.

Dr. O'DONOVAN said there was an interest which had not been referred to that night—namely, the poor individuals who had the whole of Clause 18 of this Bill devoted to them. He had no objection as a London Member to any attempt to see that the food consumed by the poor should be brought up to the standard that Members would demand in their own houses, and he would be the first to say that the public health work done by the borough councils, their medical officers of health, and other officials in London was an example to the world; but in every ointment, however healing, a fly could find its place. They were instructed in this Bill that "every medical practitioner" shall, if he suspects, do certain things. It was extraordinary that the Bill did not say "every registered practitioner," and they would perhaps find herbalists, bone-setters, and faith-healers, on the strength of this wording, claiming the status of a medical practitioner. He had thoughts to which he desired to give utterance, and thoughts which he suppressed, but in this Bill every medical practitioner, and no one else, must sign his suspicion if he suspected food poisoning. He was accustomed to notifying small-pox if he believed it to be present, but that he should be compelled to notify the suspicion of disease that might cross his mind was rather too much. If he suspected food-poisoning, in the hard-hearted language of the law he must notify it by certificate forthwith.

DOCTORS AS INITIATORS IN CRIMINAL PROSECUTIONS.

If notification were for the good of the public health he would willingly notify, not on paper but by telephone, but he gathered that the London County Council was out to punish those who poisoned Londoners, and the suspicion of a doctor put upon paper might be the first instrument by which the wheels of punishment were put in motion. He asked the House to put themselves in the position of a simple honest practitioner of medicine who committed these suspicions to papers and then someone died. These matters often raised great doubt and controversy, and yet in its zeal, and proper zeal, for the guardianship of the public health, the proper authority might decide to have an investigation. What was then the position of a doctor who had committed his suspicions to paper when he was being cross-examined by the most skilful counsel that the Food Trade Association could put up to humble his suspicions to the dust?

DELAYED PAYMENT.

Furthermore there was perpetuated in this Bill an extraordinary wrong. A doctor could be assessed at two separate values. He was worth under this Bill 2*s.* 6*d.* if he was a practitioner, free and unpanelled; but if he took service under an authority and became a medical officer, or if he worked for nothing in a dispensary or a hospital, his suspicion or opinion was worth not 2*s.* 6*d.* but 1*s.* (Laughter.) He noticed that although the practitioner must notify forthwith, nevertheless there was no arrangement for payment forthwith, and it was the practice of many local bodies to accumulate these small debts, these half-crowns or shillings that were very acceptable to very young doctors starting in practice, and then to send a cheque six or nine months afterwards when the doctor had left the hospital, and the cheque became a derelict. An act which was compulsorily done forthwith should be paid for forthwith.

"EVERY PRACTITIONER ATTENDING."

It was not uncommon in difficult cases for doctors to be called in consultation, and hitherto in cases of notification there was no compulsion upon a consultant to notify. He gave his opinion to the doctor in attendance, and that was his liability; but this Bill said "every medical practitioner attending," and in drawing all the doctors in it missed the most useful source of information by its very precision of words, for often food-poisoning was not known till death, and the doctor who diagnosed food-poisoning at its deadliest and most dangerous point was not the medical practitioner in attendance, but a pathologist, and a pathologist who might let them know at the very beginning of a fatal epidemic was excluded from the Bill. He had every sympathy with the purpose of the Bill, but in this particular clause he would ask the House to remember that they were throwing upon his profession without intention a certain responsibility in criminal proceedings. They were making the medical profession initiators of criminal prosecutions on suspicion for a fee of a shilling, and there was no defence in the Bill for an honest mistake made by a man who might not be a shining light in the healing art.

DIFFICULTIES OF NOTIFICATION.

Captain FRASER said that the House ought to be sure that the provisions of this Bill were workable. There were various forms of food-poisoning. There was botulism, a very rare form, and one hardly contemplated by the provisions of the Bill. Then there were those forms of poisoning due to poisonous substances being added to food, either for the purpose of preserving the food, and which in excess became poisonous, or which were due to accident. Many cases of so-called food-poisoning arose from these causes, but they were all very slight. The inspectors or medical men would be going on an entirely blank trail if they made any inquiries about them. Then there was the commonest form of food-poisoning at which this Bill doubtless was directed, which was produced by the Gaertner bacillus. That particular bacillus existed in clean as well as in dirty surroundings. The mere removal of dirty surroundings would not remove the possibility or probability of the bacillus being present. It was present in certain kinds of meat and in rodents. It was also present in human beings. It poisoned immediately because the bacillus had put poison into the tissue of the meat, and the poison entered into the human being who had absorbed it. No inspector could find that out by mere insistance on cleanliness. Moreover, there were persons who were carriers of this particular bacillus. They became immune, but they could transmit the bacillus to any food they touched. This Bill would not do what was claimed for it. In the first place it would involve too great an expense, and the community could not afford what might have been desirable two or three years ago; secondly, there was no proof that it would be of the slightest use; and thirdly, there had not been time over a wide enough area for full criticism and complaint to have come forward. Never before had a medical man been asked to notify a disease which was so ill-defined as food-poisoning. He did not think that the mere patching up of these clauses in Committee would meet the case. On every ground Clause 18 ought to be withdrawn. The L.C.C. in the defence of their proposals told them that there were 11 deaths in three years. Yet this vast machinery was to be set up to prevent the recurrence of those cases. He would not mind expenditure to save life, but the accumulation of this kind of expenditure threatened life by making life intolerable for the people. The London County Council could get their Bill through swiftly if they would leave out the offending clauses.

MUCH UNCLEANLINESS.

Mr. LOGAN said he knew the benefits from a sanitary point of view which had been derived in Liverpool from registration under the Public Health Act. Had it ever occurred to hon. Members how much uncleanliness there could be in a great city like London in the production of ice-cream and foodstuffs? They allowed health visitors to see if houses were kept clean and not overcrowded, and yet if one bought an ice-cream in London they were not able to tell the purchaser whether it was made in a stable or in a palace. He thought that the London County Council and the sanitary authorities of London were perfectly justified from the point of view of public health in asking for these powers.

Mr. G. HARVEY said that in view of the desire of the Minister of Health that the matters raised in the debate should be thrashed out in Committee, and in view of the desire of those who objected to certain clauses of the Bill not to hamper in any way reasonable operations on the part of the L.C.C., he asked leave to withdraw his motion for rejection.

The amendment was withdrawn, and the Bill was read a second time.

VETERINARY SURGEONS BILL.

On Friday, March 4th, in the House of Commons, the Veterinary Surgeons (Irish Free State Agreement) Bill, which has already passed through the House of Lords, was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 2ND.

Health Insurance Expenditure.

Mr. BUCHANAN asked the Minister of Health the number of persons weekly receiving health insurance benefit, and if the amount was showing an increase or a decrease since the issue of leaflets and instructions to approved societies, doctors, and burgh insurance committees at the end of 1929.—Mr. ERNEST BROWN (Parliamentary Secretary to the Ministry of Health) replied: The rate of expenditure shows a decrease, and it may be inferred that there is also a decrease in the numbers.

Mr. BUCHANAN asked if the hon. gentleman could state the actual decrease.

Mr. BROWN: The decrease in numbers could not be stated without examining the records of nearly 8000 approved societies. As regards the amount, the figures will be available in July when the report is published.

Sir P. HARRIS: Does this mean that there has been a general improvement in the health of the insured population?

Mr. BROWN: I should like to have notice of that question.

Mr. BUCHANAN: Is the decrease the result of the recent circular, or are there other factors; and is not a decrease contrary to what would be expected, seeing that where unemployment is great sickness usually increases?

Mr. BROWN: The hon. Member would be unwise to draw the conclusion that the circular is the only factor to be considered.

West Middlesex Sewage Scheme.

Mr. MCENTEE asked the Minister of Health if it was at the request of the Ministry that the West Middlesex sewage scheme had been suspended; and whether, having regard to the need for this scheme and the number of persons who would be employed, he would urge the Middlesex County Council to proceed with the undertaking.—Sir E. HILTON YOUNG replied: I am informed that the West Middlesex sewage scheme has not been suspended. Nine contracts, of a total value of well over 1¼ million pounds, have been entered into by the county council, six of which are in active operation. Not less than 725 men are already employed on the scheme.

THURSDAY, MARCH 3RD.

Bread Prices.

Mr. D. FOOT asked the Minister of Labour the present comparative price of the 4 lb. wheaten loaf in the following countries: Great Britain, France, Germany, Belgium, Austria, Czechoslovakia, the United States of America, Canada, Australia, Ireland, South Africa, Norway, and Sweden.—Sir H. BETTERTON (Minister of Labour) replied: The latest figures available as to the average prices of white bread in the countries named are given in the Table. In the absence of information concerning the qualities of bread to which the various quotations relate, it is not known how far the prices shown may be regarded as comparable one with another.

Country.	Date.	Average price per 4 lb. of white bread.
Great Britain and Northern Ireland (general average) ..	Feb. 1st, 1932.	7*d*.
France (Paris)	January, 1932.	4·09 francs.
Germany (6 large towns)	1931.	1·49 reichsmarks.
Belgium (Brussels) ..	,, 1931.	3·16 francs.
Austria (Vienna) ..	Middle of January, 1932.	2·82 schillings.
Czechoslovakia (general average)	December, 1931.	4·2 korunas.
United States of America (51 towns)	Dec. 15th, 1931.	28·8 cents.
Canada (69 towns) ..	Beginning of December, 1931.	24 cents.
Australia (6 large towns)	Sept. 15th, 1931.	7·2*d*. to 10·9*d*.
Irish Free State (general average).	Middle of November, 1931.	8*d*.
Union of South Africa (9 towns)	December, 1931.	14·72*d*.
Norway (general average)	November, 1931.	1·25 kroner.
Sweden (49 towns) ..	January, 1932.	1·35 kroner.

Note.—The figures given are taken from official publications of the countries concerned, except in the case of Germany and Belgium, for which countries they are extracted from the "International Labour Review," published by the International Labour Office, which is the only available source of information as to the price of white bread in those countries.

Imported Milk and Public Health.

Mr. KIMBALL asked the Minister of Health whether any action had been taken to discover if fresh milk imported

from abroad, which had been pasteurised once before exportation and a second time after importation, had been sold in this country as pasteurised milk.—Sir E. HILTON YOUNG replied: The inquiries made by officers of my department have afforded no evidence that any such milk has been sold in this country as "pasteurised milk."

Child Adoption.

Mr. LOVAT-FRASER asked the Minister of Health if his attention had been called to the fact that in some cases foster-parents who took children under the Children Act, 1908, were paid lump sums and then disappeared, leaving the children chargeable to the public assistance committee; and whether he proposed to take legislative steps to prevent this in future.—Sir E. HILTON YOUNG replied: No cases of the kind described have been brought to my notice.

Vaccination Declarations.

Mr. GROVES asked the Home Secretary whether his attention had been called to the refusal of certain London stipendiary magistrates to take statutory declarations under the Vaccination Act, 1907, when sitting in open court; and whether he would send a communication to the London stipendiary magistrates on this subject.—Sir H. SAMUEL replied: My department has received no complaints of the nature indicated for some time past.

National Radium Trust.

Mr. JOHN asked the Minister of Health if he would furnish figures of the receipts and expenditure of the National Radium Trust up to Dec. 31st, 1931.—Sir E. HILTON YOUNG replied: I am informed by the National Radium Trust that the total amount received by the Trust from its inception in July, 1929, to Dec. 31st, 1931, from public subscriptions, moneys voted by Parliament, and interest on temporary investments, was £258,536 13*s.* 1*d.* The payments made in the same period (excluding those made by way of temporary investment) were as follows:—

	£	*s.*	*d.*
Purchase of radium and containers	217,726	11	2
Advances to Radium Commission	2,700	0	0
Testing and measurement of radium	1,616	0	0
Other expenses of the Trust	562	8	2
Total	£222,604	19	4

Prevention of Thames Floods.

Mr. MOREING asked the Minister of Health when it was expected that the departmental committee on Thames Floods Prevention would resume its sittings; and how soon it would issue its report.—Sir E. HILTON YOUNG replied: The work of this and various other committees was suspended as a measure of economy. I propose to take the question of resumption into consideration at an early date.

Telephone Subscribers and Deafness.

Major JESSON asked the Postmaster-General whether, having regard to the fact that at least 20 per cent. of telephone users suffered from deafness to a degree that prevented them from hearing the muffled sound of the double bell at present in universal use, he would consider its replacement by a single bell of more resonant quality.—Mr. GRAHAM WHITE (Assistant Postmaster-General) replied: Experience indicates that the ringing apparatus normally supplied meets the requirements of subscribers generally. Further a bell of different pitch which is found to be more suitable in certain cases is supplied without charge, and an extension bell with a larger gong is provided at an additional charge when desired.

MONDAY, MARCH 7TH.

The Indian Medical Service.

Mr. KIRKPATRICK asked the Secretary for India if he was aware that there was a feeling of uncertainty and apprehension among officers of the Indian Medical Service as to the security of their pensions; and whether the British Government guaranteed those pensions.—Sir S. HOARE replied: I am aware that there is, and has for some time been, some anxiety among officers of the Indian Services generally as to the security of their pensions, though I have not received any special representations from officers of the Indian Medical Service. The pensions of officers of the Indian Services are not guaranteed by the British Government; they are a charge on Indian revenues, and the responsibility for ensuring that the necessary funds are forthcoming rests with the Secretary of State for India. The Services subcommittee of the Indian Round Table Conference recommended that when a new constitution for India is drawn up, suitable safeguards for the payment of pensions should be provided, and the Prime Minister, in the statement made by him on behalf of His Majesty's Government, at the final meeting of the first conference, laid it down that the transfer to a responsible Government in India of responsibility for the finances of that country must necessarily be subject to such conditions as would ensure the fulfilment of the obligations incurred under the authority of the Secretary of State and the maintenance unimpaired of the financial stability and credit of India. The consent of Parliament would be required to any change in the present position, and it is inconceivable to the present Government that in dealing with any scheme of constitutional change in India, Parliament could fail to provide such safeguards as may be necessary to ensure due payment of pensions to officers who have served the country.

First-aid and Medical Aid in India.

Mr. PARKINSON asked the Secretary for India what arrangements were made by the authorities to give first-aid and medical attention to those injured by lathi charges or rifle fire.—Sir S. HOARE replied: The reports received by me show that the senior officers present are always careful to ensure that injured persons receive attention, and, when necessary, are conveyed to the nearest hospital or dispensary at the first opportunity.

Closing of Pensions Hospitals.

Mr. LOGAN asked the Minister of Pensions what Ministry hospitals had been closed in the past 12 months; and whether it was proposed to close further hospitals and make arrangements for pensioners to be treated in hospitals near their own homes on a capitation basis.—Major TRYON replied: Four hospitals—namely, Fernbank near London, Highbury Hospital, Birmingham, Blackrock Hospital, Dublin, and Kirkburton, an institution for mental cases near Huddersfield—have been closed during the past 12 months. Another institution may be closed in the current year if alternative arrangements for the treatment of patients can satisfactorily be made. The policy of the Ministry is to make use of civil hospitals as far as possible consistently with the interest of the Ministry's patients, but there are certain types of disability, as, for example, epilepsy, mental disorder, and neurasthenia, and certain types of surgical case, for which specialised arrangements or institutions are desirable in the interest of the patients.

Milk and Milk Products Commission.

Dr. CLAYTON asked the Minister of Agriculture whether he proposed to appoint a reorganisation commission for milk and milk products.—Sir JOHN GILMOUR replied: Yes, Sir.

Hypodermic Syringes for Panel Patients.

Dr. O'DONOVAN asked the Minister of Health what were the regulations governing the prescription and supply of hypodermic syringes to patients suffering from asthma under the care of practitioners on the panel and needing such syringes for self-treatment.—Sir E. HILTON YOUNG replied: The appliances in question are not included in the list of appliances contained in the Second Schedule to the Medical Benefit Consolidated Regulations, 1928, and cannot, therefore, be supplied as part of medical benefit.[1]

TUESDAY, MARCH 8TH.

Pithead Baths.

Mr. PRICE asked the Secretary for Mines the number of coal-mines furnished with pithead baths in each mining area of England, Scotland, and Wales; and the number of cases in which these had been provided out of the Miners' Welfare Fund.—Mr. ISAAC FOOT replied: The total number of coal-mines in England, Scotland, and Wales furnished with pithead baths for workmen is 103. Of these baths, 85 were provided out of the Miners' Welfare Fund, and six were partially paid for by the Fund. In addition, 41 installations, all provided out of the Fund, are in course of construction.

[1] See THE LANCET, Feb. 20th, p. 421.

HAMPSHIRE HOSPITALS.—According to the annual report of the Royal Hampshire County Hospital there were last year 2627 in-patients, an increase of 224; 2001 of them were operated upon. They were thus distributed: men, 732; women, 1072; children, 823. There were 6220 out-patients, an increase of 184, of whom 768 were operated upon. The total average cost of each patient has fallen from £9 3*s.* 3*d.* to £8 4*s.* 8*d.*—The Royal South Hants and Southampton Hospital last year reduced the weekly cost per patient from £2 18*s.* to £2 16*s.* 4*d.* The overdraft of £59,000 has been reduced to £18,000 by the sale of securities.

OBITUARY

ARTHUR BOULTON, M.R.C.S. Eng., D.P.H.

Dr. Boulton, who died on Feb. 15th at the age of 65, was the son of the late Dr. A. E. Boulton, of Horncastle. Educated at Epsom College, he studied medicine at Charing Cross Hospital, and took the conjoint diploma in 1890. A few years later he obtained the D.P.H., having in the meantime acted as surgeon to the Cornelia Hospital at Poole, surgeon to the Clan Line, while for a time he was assistant visiting surgeon to the Albany General Hospital, Grahamstown, S. Africa. On returning to England he became M.O.H. to the Horncastle rural and urban district councils and to the Woodhall Spa urban district council. He was inspector for epileptic and mentally defective children to the Lindsay Educational Committee, medical superintendent of the isolation hospital, medical officer to the Horncastle Dispensary, and medical referee to several insurance companies. In his early days Dr. Boulton had been a keen sportsman and a good footballer, while he was an accomplished amateur actor.

BOSTON ELPHINSTONE FORDYCE, M.B. Edin.

Dr. Fordyce, who died at a nursing home in Cambridge on Feb. 19th at the age of 74, was a well-known medical man in the city, having been in practice there for more than 40 years. Born at Duns, Berwickshire, in 1858, he graduated in medicine and surgery at Edinburgh in 1883. Early in his professional life he came to Cambridge, and soon acquired a considerable practice. He was an active member of the British Medical Association, on which body he represented East Anglia, while he also interested himself in public affairs, and became a member of the Cambridge county council in 1895. He was made an alderman in 1913, the year before he resigned from the council, and during the 19 years of his municipal service he did useful work on public health and education committees. In 1922 he became a member of the Cambridge town council, representing West Chesterton ward till 1926, and interested himself in public health and maternity and child-welfare work. He married Mabel, youngest daughter of the late Dr. William Moxon, of Northampton, and leaves two daughters and one son.

Dr. ROBERT EMMERSON BROWN, who died at Willington, Co. Durham, at the age of 67, was a popular practitioner and a prominent Freemason. He retired from practice last year. Qualifying with the Scottish triple qualification in 1890, Dr. Brown set up in practice at Willington, and met with professional success at once. He was appointed medical officer of health to the urban council, and held the post for 40 years; also a similar office for the western district of the Durham union for 30 years. His other public appointments included those of colliery surgeon for the Brancepeth group of collieries, police surgeon, and railway surgeon. He leaves a widow and a son, Dr. R. A. Brown, who has assisted his father for some years.

Dr. OLIVER BARBER, whose death took place on Feb. 14th at St. Leonards, Sussex, was in practice for more than half a century there and in Sheffield. He was born in Yorkshire, and qualified in 1872 with the usual diploma, and after holding a resident post at the South Staffordshire Hospital, Wolverhampton, became resident surgeon at the Sheffield Royal Infirmary, and demonstrator of anatomy at the School of Medicine, now a department of the University of Sheffield. On retiring from this post he graduated M.D. at St. Andrews in 1892 and joined his brother in Sheffield in private practice, but a severe illness in 1896 caused him to seek the climate of Hastings, where he remained until his death, and in active practice until 1919. During the war he was examiner for recruits for the Hastings district, a duty which he discharged with efficiency.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments have been notified: Surg. Comdr. J. D. Bangay to *Victory*, for R.N. Barracks.

Surg. Lts. W. D. M. Sim to *Pembroke*, for R.N. Barracks; and W. V. Beach to *Delhi* and to *Dragon*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. A. C. Howard to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

The notification of the relinquishment of the prov. rank of Capt. by Lt. (prov. Capt.) J. W. Kendall, half-pay list is cancelled.

Lt. (on prob.) R. C. Langford is restd. to the estabt.

Lt. W. D. Hughes to be Capt.

The undermentioned to be Lts.: C. S. Gross and D. P. F. Mulvany, from temp. commns.

T. J. Moloney is granted a temp. commn. in the rank of Lt.

TERRITORIAL ARMY.

Col. Sir W. R. Smith vacates the appt. of Hon. Col. R.A.M.C., Units, 44th (Home Counties) Div. T.A., on completion of tenure.

Col. C. P. Oliver (late R.A.M.C., T.A.) to be Hon. Col. R.A.M.C., Units, 44th (Home Counties) Div. T.A.

Col. J. Clay vacates the appt. of Hon. Col. R.A.M.C., Units, 50th (Northumbrian) Div., T.A., on completion of tenure.

Col. J. M. Gover to be Hon. Col. R.A.M.C., Units, 50th (Northumbrian) Div., T.A.

DEATHS IN THE SERVICES.

Lt.-Col. James Henry Reynolds, A.D.M.S. (retd.), V.C., who died at the age of 88 on March 4th, was the son of Mr. L. Reynolds, J.P., of Co. Longford, and was born at Kingstown in 1844. He graduated in medicine and surgery at Trinity College, Dublin, in 1867, and received his first commission in the Army in the following year. In 1875 he accompanied the expedition to Griqualand, and afterwards distinguished himself in the South African operations of 1877–79, serving in the Kaffir campaign and the Zulu campaign, and being present at the Defence of Rorke's Drift and at the battle of Ulundi. It was at Rorke's Drift that he won the V.C., the official record being "for the conspicuous bravery during the attack at Rorke's Drift on Jan. 22nd and 23rd, 1879, which he exhibited in his constant attention to the wounded under fire, and in his voluntarily conveying ammunition from the store to the defenders of the hospital, whereby he exposed himself to a crossfire from the enemy both in going and returning." Mentioned in despatches, he also received the medal with clasp, and was specially promoted Surg.-Major. He was awarded the Gold Medal of the British Medical Association, elected an honorary Fellow of the Royal College of Physicians of Ireland, and made an honorary LL.D. of Dublin. Lt.-Col. Reynolds married in 1880 Elizabeth, daughter of Dr. McCormick. He retired in 1896.

It will be recalled that Lt.-Col. Reynolds was one of the seniors among the distinguished company who attended the dinner to V.C.'s, over which the Prince of Wales presided at the House of Lords in 1929.

LEWES HOSPITAL PENNY FUND.—In the eight years of its working £8950 has been raised by this Fund; £6491 has been paid to the Lewes Victoria Hospital and £353 to other institutions. The total cost of administration in the eight years has been only £106.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

PULMONARY TUBERCULOSIS: AN END-RESULT.

In his annual report Dr. William Munro, superintendent of Glenlomond Sanatorium, makes a very emphatic statement on the "lateness" of pulmonary tuberculosis. For several years he has been making observations on this problem, which is undergoing discussion everywhere. He states that pulmonary tuberculosis is an end-result, a late visceral manifestation of a previous infection.

"Some medical observers seem to have difficulty in accepting this truth. London observers do not appear to regard pulmonary tuberculosis as a late manifestation of a childhood infection. They are wrong and far wrong. The facts are all against them. They point out that in searching the histories of their adult pulmonary cases, they have been struck with the fact that few of them ever had treatment for any tuberculosis condition in earlier years. They cannot have searched the histories very well. They miss systematic disturbance of a primary infection."

Dr. Munro states that he has pleaded for an examination of school-children to determine the number of reactors, and at leaving that knowledge would be priceless. From the knowledge supplied by a routine test one could be on guard every time. Further spreads of tuberculosis could be correctly appraised and steps taken towards complete arrest of the disease in the earliest manifestations. Needless to say, this view is not universally accepted. By this time, the data for a final decision should be sufficient.

DIPHTHERIA IMMUNISATION.

In the London County Council report on diphtheria, Edinburgh, Aberdeen, Dundee, and Glasgow get full credit for their pioneer work in this field. Aberdeen and Edinburgh stand easily first. It is difficult to understand why either Scotland or England has been so slow to develop the Schick test and toxoid immunisation as well as scarlet fever immunisation. But the amount actually accomplished in Scotland has, on the whole, been very satisfactory. In Aberdeen, Dundee, and Edinburgh the parents became enthusiastic.

MEDICAL NEWS

University of London.

The University Court has accepted a gift of £88,000 from the Rockefeller Foundation towards the endowment of the department of zoology and comparative anatomy at University College. The gift was conditional, inter alia, on the University providing £30,000 for land, buildings, and equipment, and this condition has now been met.

The Senate has approved in principle the institution of an Academic Diploma in Radiology, and syllabuses therefore will be issued in due course.

Sir Ernest Graham-Little, M.P., has been appointed a member of the court of governors of the London School of Hygiene and Tropical Medicine, and Sir William Collins will represent the University at the tercentenary celebrations of the University of Amsterdam next June.

The Senate will shortly consider applications for grants from the Dixon Fund for assisting scientific investigations, and for the Thomas Smythe Hughes and Beaverbrook Medical Research Funds for assisting original medical research. Applications must be received in proper form not later than May 15th. Application is also invited for the Laura de Saliceto Studentship for the advancement of Cancer Research, which is of the value of £150 a year. Candidates may be of either sex and need not be members of the University. Further particulars may be had from the Academic Registrar.

International Society of Orthopædic Surgery.

The second congress of this society will be held in London at the house of the Royal Society of Medicine from July 19th to 22nd, 1933, under the presidency of Prof. Nové-Josserand, of Lyon.

Territorial Army Medical Officers' Association.

A general meeting of this association will be held at 37, Russell-square, London, W.C., on Thursday, March 17th, at 3 P.M., at which all Territorial Army medical officers (active and retired) are invited to be present.

Lectures on Tropical Hygiene.

The British Red Cross Society will hold a course of seven lectures and demonstrations on tropical hygiene at 5.30 P.M. on Mondays, Wednesdays, and Fridays, from April 4th, at 9, Chesham-street, London, S.W.

Royal Medical Benevolent Fund.

The ninety-sixth annual general meeting of this Fund will be held in the rooms of the Medical Society of London, 11, Chandos-street, W., at 5 P.M., on Tuesday, March 15th.

Radium Institute, London.

Lord Moynihan, of Leeds, has been elected a member of the committee of this Institute in the place of Sir Hugh Rigby, who has resigned.

Sheffield Hospitals' Contributory Fund.

Last year this fund collected £103,861, a decrease of £7585; but 32,000 contributors have promised to increase their weekly payments from 1*d.* to 2*d.* in the pound, which will add £9500 to the annual income.

Nottingham General Hospital.

Mr. R. G. Hogarth, senior surgeon of Nottingham General Hospital, recently reopened the old main theatre of the institution which has been reconditioned at a cost of £4000, given by Sir Thomas Shipstone. It will in future be known as the Shipstone theatre.

Enlargement of Weymouth Hospital.

The Earl of Shaftesbury, Lord-Lieutenant of Dorset, has opened an extension of Weymouth and District Hospital which has cost £15,000. The additions comprise a large waiting-room, a new dispensary, a casualty room adjoining the main entrance, a new theatre, four doctors' consulting rooms, a dental surgery, ear, nose, and throat, electrical and massage departments, and an extension of the X ray room.

Society of Public Analysts.

The fifty-sixth anniversary dinner was held on March 4th at the Trocadero, when the chair was taken by the retiring President, Mr. J. T. Dunn, public analyst for Newcastle-on-Tyne. The President-elect, Mr. F. W. F. Arnaud, occupied the vice-chair. Among the guests were Lord Atkin, who proposed the toast of the Society; the Lord Mayor of Newcastle, the President of the Royal Society, Sir Ernley Blackwell, and Sir Ernest Graham-Little. In replying to the toast of the Civil Service, Sir E. Blackwell referred to the appointment of two early members of the Society, Sir Thomas Stevenson and Dr. C. Meymott Tidy, as the first Home Office analysts, and remarked that the findings of fact by the official analyst were invariably accepted by the other side in court, although alternative explanations were frequently offered. Lord Atkin referred to his experiences of the working of the Food and Drugs Act as a member of a county bench in Wales. He stressed the importance of adequate standards, not only for milk, but for any other foods to which they might be applicable. He quoted Tennyson's lines (from Maud) written at a time (1855) when public opinion on the adulteration of foods and drugs was becoming ripe for legislation—

"... chalk and alum and plaster are sold to the poor for bread,
And the spirit of murder works in the very means of life."

and

"... another is cheating the sick of a few last gasps, as he sits
To pestle a poisoned poison behind his crimson lights."

Sir Gowland Hopkins, in responding for the Kindred Societies (proposed by Mr. A. Chaston Chapman, F.R.S., a past President) which were also represented by Prof. G. T. Morgan (President of the Society of Chemical Industry), Mr. Percy Gates (President of the Institute of Brewing), Mr. George Gray (Vice-President of the Institute of Chemical Engineers), by the Registrar, Mr. R. B. Pilcher, and many Fellows of the Institute of Chemistry, referred to his early days as an articled pupil of a public analyst.

King Edward's Hospital Fund for London.

Hospitals within 11 miles of St. Paul's desiring to participate in the grants made by King Edward's Hospital Fund for London for the year 1932 must make application before March 31st to the hon. secretaries of the Fund at 7, Walbrook, E.C. 4. Applications will also be considered from convalescent homes which are situated within the above area or which take a large proportion of patients from London.

Victor Horsley Memorial Lecture.

The Victor Horsley Memorial Fund was raised in 1920 to commemorate the services of Sir Victor Horsley to science and the Empire, and is devoted to the giving of a lecture triennially in London entitled the Victor Horsley Memorial Lecture. The fourth lecture is due to be delivered in 1932, and the trustees (who consist of the Presidents of the Royal Society, the Royal College of Surgeons of England, and the British Medical Association, the senior physician of the National Hospital for the Paralysed and Epileptic, Queen-square, the senior surgeon of University College Hospital, and Mr. Stanley G. Robinson, the son-in-law of Sir Victor Horsley) have invited Prof. E. D. Adrian, F.R.S., F.R.C.P., of Cambridge, to give the lecture. This he has consented to do, and the lecture will be delivered on July 20th next, under the title of Visceral Sense Organs. It is hoped that Sir Frederick Gowland Hopkins, F.R.C.P. (President of the Royal Society), will take the chair, and further details will be published later.

Contributory Patients and Medical Staffs.

Last year the Pembrokeshire County War Memorial Hospital admitted the record number of 862 in-patients, and the annual report expresses the hope that "at some future time, when money permits," it may be further extended. The report of the medical staff contends that this time has come, since the hospital is "in a happy and unusual financial position," and calls attention to "the total inadequacy of accommodation and resulting overcrowding of patients in the wards," which results almost entirely from emergency admissions. The present situation is "totally unacceptable to the visiting staff." Last year's income was increased from just over £7000 to just under £8000, mainly on account of the "extraordinary measure of popularity" of the contributory scheme. The medical staff think that there should be more efficient control over the eligibility for treatment of patients under that scheme. They suggest the appointment of a reception committee "with a due representation of the medical staff." The medical fund received £958, at the rate of £2 3*s.* 3*d.* for every contributory patient.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, March 14th.—4.30 P.M., UNITED SERVICES. Paper: Squadron-Leader T. C. St. C. Morton: The Ætiology and Treatment of Heat Exhaustion and Heat Hyperpyrexia.

TUESDAY.—5.30 P.M., GENERAL MEETING OF FELLOWS. Ballot for election to the Fellowship. 8.30 P.M., PATHOLOGY. Annual General Meeting. Election of Officers and Council. Communications: A. Castellani: An Amœba Living Parasitic on Cultures of Certain Bacteria and Fungi. Remarks on Its Peculiar Physiological Characters. H. Burt-White: Dissemination in Irradiated Carcinoma of the Cervix. B. D. Pullinger: Causes of Cell Death in Irradiated Human Tissue. A. Eldinow: Immunisation by the Injection of Irradiated Antigenic Substances.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Meeting at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C. Lecture demonstration: Prof. R. T. Leiper: Helminthic Infections of Medical and Economic Interest. Tea at 4.30 P.M. 8 P.M., EPIDEMIOLOGY AND STATE MEDICINE. Paper: Dr. Robert Pierret: Present Situation in France of Biological Prophylaxis and Treatment in Certain Contagious Diseases, Especially Cerebro-spinal Meningitis, Measles, and Whooping-cough.

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.) Cases: Dr. H. C. Semon: 1. Case for Diagnosis. Other cases will be shown. 8.30 P.M., NEUROLOGY AND MEDICINE. Special discussion on the Functions of the Sympathetic Nervous System. Openers: Prof. H. H. Woollard, Dr. W. Russell Brain, Prof. Samson Wright, Dr. A. F. Hurst, and Dr. W. Langdon Brown. Other speakers will take part.

FRIDAY.—5.30 P.M., PHYSICAL MEDICINE. Clinical Meeting at the Royal Free Hospital, Gray's Inn-road, W.C. Short paper: Mr. P. Jenner Verrall: The Relationship of Orthopædics to Physical Medicine. 8.15 P.M., OBSTETRICS AND GYNÆCOLOGY. Short communication: Dr. G. I. Strachan: Adeno-carcinoma of the Vagina. Papers: Dr. G. D. Madill: A Study of Some Recent Views on the Function of the Ovary and Especially of the Corpus Luteum. Dr. James Young: Toxæmias of Pregnancy. 8.30 P.M., RADIOLOGY. Cases will be shown by Dr. P. Kerley, Dr. Courtney Gage, Dr. Stanley Melville, and Dr. Graham Hodgson. 9 P.M., Paper: Dr. J. F. Brailsford: Cholecystography. A discussion will follow which will be opened by Mr. Stanford Cade and Dr. Cochrane Shanks.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, March 14th.—8.30 P.M., Discussion on Non-Infective Nephritis to be introduced by Dr. Arthur A. Osman and Prof. O. L. V. S. de Wesselow.

WEDNESDAY.—9 P.M., Mr. F. A. Williamson-Noble: The Reactions of the Eye to General Disease. (Third Lettsomian lecture.)

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Portland-place, W.

THURSDAY, March 17th.—5.30 P.M., Opening of Manson House, 26, Portland-place, by the Prince of Wales. Admission by ticket only.—8.15 P.M., Laboratory Meeting at the Royal Army Medical College, Millbank. Demonstrations by Dr. C. C. Chesterman, Dr. G. M. Findlay, Dr. C. A. Hoare, Colonel S. P. James and Prof. Warrington Yorke, Dr. J. Nell Leitch, Dr. Llewellyn Lloyd, Prof. J. G. Thomson and Dr. A. Robertson, and others.

HARVEIAN SOCIETY OF LONDON.

THURSDAY, March 17th.—8.30 P.M. (at Town Hall, Paddington Green, W.), Sir Bernard Spilsbury: Pulmonary Embolism. (Harveian lecture.)

CHELSEA CLINICAL SOCIETY, Rembrandt Hotel, London, S.W.

TUESDAY, March 15th.—8.30 P.M. (preceded by dinner at 7.30), Prof. F. T. G. Hobday: Some Variations and Analogies in Human and Animal Surgery.

MEDICO-LEGAL SOCIETY.

TUESDAY, March 15th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.), Dr. L. A. Parry: Abortion—Some Medical, Legal, and Sociological Aspects.

EUGENICS SOCIETY.

TUESDAY, March 15th.—8.30 P.M. (at the Rooms of the Linnean Society, Burlington House, W.), Mr. J. M. Bickerton: Eugenics and Blindness.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, March 15th.—5 P.M., Dr. C. E. Lakin: The Borderlands of Medicine. (Second Lumleian lecture.)

THURSDAY.—5 P.M. (Last Lumleian lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, March 14th, to SATURDAY, March 19th.—Mon. and Fri., M.R.C.P. Evening Course. 8 P.M., at the London Temperance Hospital, Hampstead-road: Five demonstrators each evening, pathological specimens. Wed., 8.30 P.M., at the Medical Society Lecture Room: Lecture by Dr. Donald Hunter on Significance to Clinical Medicine of Calcium Metabolism.—GORDON HOSPITAL, Vauxhall Bridge-road, S.W. Post-graduate course in Proctology, all day, for one week.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W. Lecture-demonstrations daily at 5 P.M.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Course in Medicine, Surgery, and Gynæcology, all day.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Great Portland-street, W. Course in Orthopædics, all day.—BETHLEM ROYAL HOSPITAL, Monks Orchard, Eden Park, Beckenham. Tues. and Fri., at 11 A.M., Lecture Demonstration in Psychological Medicine. The above Courses are open only to Members.—CITY OF LONDON HOSPITAL, Victoria Park, E. Tues., 3 P.M., Demonstration of Chest Cases by Dr. K. Shirley Smith.—WESTERN OPHTHALMIC HOSPITAL, Marylebone-road, N.W. Fri., 5 P.M., Demonstration of Cases of Detachment of the Retina by Mr. J. Cole Marshall. Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, March 14th.—10 A.M. to 1 P.M., Gynæcological Ward Visit. Genito-urinary Operations, Skin Department. Surgical Ward Visit. 2 P.M. to 4 P.M., Operations, Surgical Ward Visit. Medical, Surgical, Eye, and Gynæcological Out-patients.

TUESDAY.—10 A.M. to 1 P.M., Medical Ward Demonstration. Dental Department, Throat Operations. Surgical Demonstration. 2 P.M. to 4 P.M., Operations. Medical, Surgical, and Throat, Nose and Ear Out-patients.

WEDNESDAY.—10 A.M. to 1 P.M., Medical Ward Visit. Children's Medical Out-patients. 2 P.M. to 4 P.M., Gynæcological Operations. Medical, Surgical, and Eye Out-patients. 4.45 P.M., Venereal Diseases Demonstration.

THURSDAY.—10 A.M. to 1 P.M., Neurological Out-patients, Fracture Demonstration. 2 P.M. to 4 P.M., Operations, Genito-urinary, Medical, Surgical, and Eye Out-patients.

FRIDAY.—10 A.M., Medical Ward Visit. Skin Department, Dental Department. 12 noon, Medical Lecture.

2 P.M. to 4 P.M., Operations, Medical, Surgical, and Throat, Nose and Ear Out-patients.
SATURDAY.—9 A.M. to 1 P.M., Throat Operations, Medical Ward Visit. Children's Medical Out-patients. Surgical Out-patients.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham.
THURSDAY, March 17th.—4 P.M., Dr. Hector C. Cameron: Demonstration of Children's Ailments.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, March 14th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Hinds Howell: Trauma in Relation to Nervous Disorders.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Adie: Neurosyphilis.
WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Intracranial Complications of Otitis Media.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. James Collier: Remarks upon Polyneuritis.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.
SUNDAY, March 13th.—10.45 A.M., Dr. C. K. H. Hamilton: The Premature Infant. 11.45 A.M., Mr. A. C. MacLeod: Radium Therapy from the Clinical Aspect.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, March 17th.—9 P.M., Mr. W. I. Daggett: Ear, Nose, and Throat Operations of General Practice.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
WEDNESDAY, March 16th.—3.15 P.M. (at the Royal Chest Hospital), Dr. P. Kerley: Radiological Examination of Cardiac Cases.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, March 17th.—4.30 P.M., Mr. W. B. Gabriel: The Elucidation of Rectal Symptoms; Pain.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, March 18th.—4 P.M., Mr. J. D. McLaggan: Giddiness.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, March 16th.—4 P.M., Dr. H. C. Semon: Diseases of the Buccal Mucosa.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, March 15th.—5 P.M., Dr. H. MacCormac: Malignant Growths of the Skin.
THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

NATIONAL COUNCIL FOR MENTAL HYGIENE.
WEDNESDAY, March 16th.—5.30 P.M. (at 11, Chandos-street, W.), Mr. Gerald Heard: Penal Methods of the Future.

ANCOATS HOSPITAL, Manchester.
THURSDAY, March 17th.—4.15 P.M., Miss M. Hilton Royle: The Influence of Body Mechanics on Health. (With Demonstration of Exercises.)

ST. MARY'S HOSPITALS, Manchester.
FRIDAY, March 18th.—4.15 P.M. (at the Whitworth-street West Hospital), Mr. Arnold Jones: Allergic Affections of the Nose and Throat.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, March 15th.—4.15 P.M., Dr. C. H. Melland: Some Cases of Cardiac Irregularity.
FRIDAY.—4.15 P.M. Dr. A. H. Holmes: Demonstration of Medical Cases.

SALFORD ROYAL HOSPITAL.
THURSDAY, March 17th.—Mr. G. Jefferson: Demonstration of Surgical Cases.

OPHTHALMIC INSTITUTION, Glasgow.
WEDNESDAY, March 16th.—4.15 P.M., Dr. Alex. Garrow: Eye Cases.

Vacancies

For further information refer to the advertisement columns.

Abergavenny, Monmouthshire Mental Hospital.—Jun. Asst. M.O. £350.
Ascot, Heatherwood Hospital for Orthopædic Children.—Res. Med. Supt. £850.
Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. £200.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Bath, Royal Mineral Water Hospital.—Physician.
Beit Memorial Fellowships for Medical Research.—Jun. Fellows. Each £400.
Birmingham City Mental Hospital.—Med. Supt. £625.
Blackburn County Borough.—Res. Asst. M.O. and Jun. Asst. M.O. £350 and £150 respectively.
Bolton Infirmary and Dispensary.—H.P. £150.
Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.
Bristol Eye Dispensary.—Hon. Ophthalmic Surg.
Bristol Eye Hospital.—Asst. Res. H.S. £100.
Bristol Royal Infirmary.—H.S. to Jun. Hon. S. At rate of £60.
Cardiff City.—Asst. M.O. £500.
Cardiff, Welsh National School of Medicine.—Jun. Asst. in Medical Unit. £250.
Carlisle, Cumberland Infirmary.—H.S. to Spec. Dept. At rate of £155.
Chelmsford, Essex C.C.—Consultant Surgeon. £200.
Chester, East Lanchashire Tuberculosis Colony, Barrowmore Hall, Gt. Barrow.—H.P. At rate of £100.
Coulsden and Purley U.D.C.—Temporary M.O.H. At rate of £800.
Coventry and Warwickshire Hospital.—Res. H.P. and H.S. £160 and £125 respectively.
Doncaster Royal Infirmary.—Sen. Cas. H.S. At rate of £175
Dublin, Board of Assistance.—Radiologist. £300.
Edinburgh Royal Hospital for Mental and Nervous Disorders.—Asst. Physician. £300.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Gloucester, Gloucestershire Royal Infirmary, &c.—Surgeon
Guildford, Royal Surrey County Hospital.—H.S. £150.
Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. Surg. O. for Out-patient Dept. At rate of £100.
Harrogate Infirmary.—Sen. H.S. At rate of £150.
Hereford, Herefordshire General Hospital.—H.P. £150.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Whole-time Research Worker. £350. Also Med. Reg. £200.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100.
Ilford, King George Hospital.—Cas. H.S. At rate of £100.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. and H.P. Each £120.
Isleworth, West Middlesex County Hospital.—Res. Asst. M.O. £400.
Lancaster County Mental Hospital.—Asst. M.O. £500.
Liverpool City.—Pathologist. £700.
Liverpool, County Mental Hospital, Rainhill.—Asst. M.O. £500.
Liverpool and District Hospital for Diseases of the Heart.—H.P. At rate of £100.
Liverpool, Stanley Hospital.—Gynæcological H.S. At rate of £100.
London Lock Hospital, 91, Dean-street, W.—H.S. for Male Lock Hospital. At rate of £175.
Macclesfield General Infirmary.—Sen. and Second H.S.'s. At rate of £180 and £150 respectively.
Manchester Royal Infirmary, Central Branch, Roby-street.—H.S. At rate of £100.
Manchester and Salford Hospital for Skin Diseases.—Asst. M.O. £100.
Margate, Royal Sea Bathing Hospital.—Asst. Med. Supt. £500.
Middlesbrough, Holgate Municipal Hospital.—Jun. Res. M.O. At rate of £160.
Miller General Hospital, Greenwich-road, S. E.—Hon. Orthopædic Surgeon.
Northampton General Hospital.—H.P. and three H.S.'s. Each at rate of £150.
Norwich, Norfolk and Norwich Hospital.—H.P. £120.
Nottingham and Midland Eye Infirmary.—Res. H.S. £200.
Parbold, Lancs, Wrightington Hospital.—Jun. Asst. M.O. £200.
Plymouth, South Devon and Cornwall Hospital.—Hon. Radiologist.
Princess Beatrice Hospital, Richmond-road, Earl's-court, S.W.—Surgeon to Throat, Nose and Ear Dept., Physician to Out-patients' Dept. Also H.P. and Cas. O. £100.
Putney Hospital, Lower Common, Putney, S.W.—Res. M.O. At rate of £150.
Queen's Hospital for Children, Hackney-road, E.—Surgeon to Ear, Nose, and Throat Dept.
Reading University, National Institute for Research in Dairying. Director.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Ophth. S., Cas. O. £200. Also H.S. At rate of £100.
St. Alfege's Hospital, 48, Vanbrugh Hill, Greenwich, S.E.—Res. Asst. M.O. £350.
St. Helens County Borough.—Deputy M.O.H. £700.
St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. At rate of £125.
St. Thomas's Hospital.—Ophth. Reg. and Refractionist. £200.
Salford, Hope Hospital, Pendleton.—Asst. Res. M.O. At rate of £250.
Salford Royal Hospital.—Hon. Physician.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Anæsthetist.
Scarborough Hospital and Dispensary.—Two H.S.'s. Each at rate of £175.
South London Hospital for Women, Clapham Common, S.W.—H.P. and two H.S.'s. Each at rate of £100.
Southampton, Royal South Hants and Southampton Hospital.—Hon. Asst. Surg.
Southend-on-Sea, New General Hospital.—Hon. Surgeon, Physicians, &c. Pathologist £500. Radiologist £500, and Pharmacist £350.
Stafford, Staffordshire General Infirmary.—H.P. At rate of £150.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150.
Taunton, Taunton and Somerset Hospital.—Sen. House M.O. and H.S. £150 and £100 respectively.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Dental Surgeon.
Wakefield Clayton Hospital.—Two Jun. H.S.'s. Each at rate of £150.
West London Hospital, Hammersmith-road, W.—H.P. and H.S.'s., H.S. to Ear, Nose, and Throat Dept., and Res. Anæsthetist. Each at rate of £100. Also Hon. Med. Radiologist.
Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S. At rate of £150.
Willesden General Hospital, N.W.—Cas. O. At rate of £120. Also H.S. and H.P. At rate of £110 and £100 respectively.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Esher (Surrey), and Leamington (Warwick).

CORRECTION.—In the report last week (p. 514) of the Section of Comparative Medicine at the Royal Society of Medicine the remarks on milk fever and eclampsia attributed to Prof. F. J. Browne were made by Mr. R. H. Paramore.

Notes, Comments, and Abstracts

PROSTATIC CALCULI.

J. A. Lazarus and A. A. Rossenthal,[1] of New York state that 370 cases of prostatic calculi have been reported, although many more are encountered than are published. Until the introduction of radiography in routine urological examinations prostatic calculi were supposed to be rare, but modern methods of exploration have shown that they are not uncommon. As regards their ætiology the writers hold that calculi of the prostate, like those found elsewhere in the body, are due to a variety of causes. As a rule a pre-existing infection of the gland in a man with a tendency to calcium deposition seems to be the most likely explanation of calculus formation. The calculi vary in size, consistence, and chemical composition. The nucleus usually consists of epithelial debris, blood clot, bacteria, corpora amylacea, or necrotic tissue, and the surrounding layers are made up of calcium phosphate, calcium carbonate, calcium oxalate, and ammonio-magnesium phosphate. Most prostatic calculi are found in the lateral lobes, and the median lobe is an occasional site, but the anterior and posterior lobes are rarely, if ever, involved. The calculi are usually multiple, but 33 cases are on record in which only a single stone was found. Most of the cases occur after puberty, the majority being found in the fifth decade, and two-thirds of all the cases in the fourth, fifth, and sixth decades. In the writers' series of 15 cases the youngest patient was 28 and the oldest 75. In many cases prostatic calculi give rise to no symptoms but are accidentally discovered in a routine urological examination by X rays and rectal exploration. In a fair number however the following symptoms are met with in order of frequency: diurnal and nocturnal pollakiuria, dysuria, perineal, penile, and rectal pain, urgency and tenesmus, hæmaturia, retention, impotence, and hæmatospermia. The diagnosis is established by rectal examination and X rays. Prostatic calculi must be distinguished from chronic prostatitis, with hard, nodular, inflammatory, or malignant infiltration, or tuberculosis of the prostate. Complete recovery follows removal of the calculi. If the condition is left untreated, abscess formation, cystic degeneration, gangrene, or carcinoma may result. Suprapubic prostatectomy in two stages is regarded as the operation of choice, but if no symptoms are present, diathermy followed by massage of the prostate is sufficient.

AËDES EGYPTI AT BAKU.

How clever are female mosquitoes at finding safe and secret places for their eggs, *Aëdes egypti* (formerly called *Stegomyia fasciata*), which lives about human dwellings, affords an example. It has been widely reported from the Black Sea coast, but only now [2] from the Caspian, by Dr. I. Achundow, entomologist to the Baku Tropical Disease Institute, who was anxious to determine if this yellow fever carrier occurred in his area. He was lucky when a female flew into his room last July and, being caught, laid 30 eggs from which in ten days—temperature of the aquarium water 77° F.—there developed two male and three female undoubted *Aëdes egypti* imagos. About this time, as he was calling on a relative who lived in the centre of the town, Dr. Achundow was bitten by an aëdes, and, as mosquitoes were said to be a plague in that flat, though on the third floor, search was made, and in the back kitchen, under a pile of wood fuel, was found a wooden washing tub (a quarter full of water to keep it from warping) teeming with aëdes larvæ. A similar finding was made in other neighbouring flats. They do their washing in Baku every two or three weeks, and the mosquitoes have double that time if the family is on holiday.

Thus we see how thoroughly mosquito inspectors must know the customs of the people they are protecting. Who would have expected to find a mosquito breeding place on a third floor? Another thought: how many vain journeys a pregnant aëdes must have made to the woodpile before she found the family wash was over and the tub, with its welcome water content, returned into store!

[1] Urol. and Cut. Review, February, 1932, p. 99.
[2] Arch. f. Schiffs- u. Tropen-Hygiene, January, 1932, p. 31.

PHYSICAL EXERCISES FOR THE MIDDLE-AGED.

THE indiscriminate daily practice of physical exercises by the middle-aged does not always have a favourable effect on general condition, and may certainly do harm if the exercises are such as to cause undue strain. Many modern gymnastics, however, can be adapted for older people, and graduated training in suitable physical exercises undoubtedly makes for general wellbeing. Miss M. H. Spalding, late vice-principal of the Bergman Österberg Physical Training College, has started small classes for physical culture at 105A, Gloucester-road, London, S.W.7, which are specially arranged for women who have few, if any, facilities for games or sports, and have difficulty in securing regular exercise. Separate classes for men are also organised. The scheme of exercises is based on the preventive rather than the curative aspect of physical culture.

Appointments

ABERNETHY, W. R., M.B., B.Ch. Belf., D.P.H., has been appointed Superintendent M.O.H., Executive Sanitary Officer, Schools Medical Officer, and Tuberculosis Officer of Derry.

PADDINGTON GREEN CHILDREN'S HOSPITAL: Mr. DUNCAN C. L. FITZWILLIAMS, C.M.G., M.D., F.R.C.S., Consulting Surgeon to the Hospital; Mr. BERTRAM SAMUEL, L.D.S. R.C.S., Consulting Dental Surgeon to the Hospital; Mr. C. E. SHATTOCK, M.D., M.S., F.R.C.S., Surgeon with charge of In-patients; Mr. F. W. M. PRATT, M.B., B.S., F.R.C.S., Honorary Surgeon to Out-patients; and Mr. H. L. PITT, L.D.S. R.C.S., Honorary Dental Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: Hogben, G. H., L.R.C.P. Lond., M.R.C.S. (Swinton, Lancs.); Murray, J. D., M.B. Ch.B. Aberd. (Grays, Essex).

Births, Marriages, and Deaths

BIRTHS.

APPLIN.—On March 5th, at Park-lane, Croydon, the wife of H. W. Applin, M.B., B.S., M.R.C.S., of a son.

HARKNESS.—On March 7th, at Devonshire-place, W., the wife of R. C. Harkness, F.R.C.S., of a daughter.

HUNTER.—On March 2nd, at Lindfield-gardens, N.W., the wife of Dr. Donald Hunter, of a daughter.

PALMER.—On Feb. 29th, the wife of Dr. H. M. Palmer, of Wealden Stow, Bidborough, Kent, of a daughter.

WAKLEY.—On Feb. 17th, at Playden, Chipstead, Surrey, to Daisy (*née* Trist), the wife of Thomas L. Wakley—a daughter.

MARRIAGES.

HOWAT—RICKETTS.—On March 4th, at Enfield, Clarence Hugh Howat, M.B., Ch.B., to Audrey May Ricketts.

DEATHS.

CAMPBELL.—On March 1st, at Brompton Hospital, London, as the result of wounds received during the Great War, Dr. Roy Ferguson Campbell, aged 35.

GRAVES.—On March 5th, at home, Eveline Dorothy (Sister Lang), wife of Dr. T. C. Graves, Rubery Hill, Birmingham, in her 48th year.

HOAR.—On March 6th, at Montcalm, Maidstone, Charles Edward Hoar, M.D. Lond., J.P., in his 85th year.

IRVING.—On Feb. 27th, at Bell-street, Henley, Hamilton Irving, M.S., F.R.C.S., of Huddersfield.

MACVICAR.—On Feb. 27th, at Invermoidart, Acharacle, Argyll, Dr. Symers Douglas MacDonald Macvicar.

MORGAN.—On March 2nd, Leslie Stuart Morgan, M.R.C.S., L.R.C.P., aged 35.

REYNOLDS.—On March 4th, Lieut.-Colonel J. H. Reynolds, V.C., late R.A.M.C., aged 88.

SYDENHAM.—On March 7th, at Pitt House, Dawlish, Devon, George Mervyn Sydenham, M.D., aged 62.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.